

California High-Speed Train Project



Agreement No.: HSR 13-06
Book 3, Part E, Subpart 1

Directive Drawings

Revision No.	Date	Description
0	01 Mar 12	Initial Release, R0
1	31 Jul 13	EXECUTION VERSION

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GENERAL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-GE-001	GENERAL DIRECTIVE NOTES, CIVIL
DD	DD-GE-002	GENERAL DIRECTIVE NOTES, TRACK
DD	DD-GE-003	GENERAL DIRECTIVE NOTES, STRUCTURAL
DD	DD-GE-100	ACRONYMS AND ABBREVIATIONS 1
DD	DD-GE-101	ACRONYMS AND ABBREVIATIONS 2
DD	DD-GE-102	ACRONYMS AND ABBREVIATIONS 3
DD	DD-GE-103	ACRONYMS AND ABBREVIATIONS 4
DD	DD-GE-104	ACRONYMS AND ABBREVIATIONS 5
DD	DD-GE-110	SYMBOLS 1
DD	DD-GE-111	SYMBOLS 2

CIVIL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CV-001	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, EMBANKMENT
DD	DD-CV-002	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, OPEN CUT
DD	DD-CV-003	TYPICAL CROSS SECTION, TWO TRACK NON-BALLASTED, RETAINED FILL
DD	DD-CV-004	TYPICAL CROSS SECTION, ONE TRACK NON-BALLASTED, EMBANKMENT AND OPEN CUT
DD	DD-CV-005	TYPICAL CROSS SECTION, FOUR TRACK NON-BALLASTED, EMBANKMENT
DD	DD-CV-006	FENCE AND GATE DETAILS
DD	DD-CV-007	FENCE AND GATE LOCATIONS
DD	DD-CV-008	FENCING ON GRADE SEPARATED STRUCTURES
DD	DD-CV-009	FENCE AT CULVERT CROSSINGS
DD	DD-CV-010	MINIMUM CLEARANCE, GRADE SEPARATED STRUCTURES
DD	DD-CV-011	ACCESS ROADS AND DRIVEWAYS

DRAINAGE		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CD-001	NON-BALLASTED AERIAL STRUCTURE, BRIDGE DECK DRAINAGE SYSTEM
DD	DD-CD-002	AERIAL STRUCTURE, BEGIN AND END BRIDGE DRAINAGE SYSTEM
DD	DD-CD-003	AT-GRADE TRACK, DRAINAGE SYSTEM
DD	DD-CD-004	AT-GRADE STATION PLATFORM, DRAINAGE SYSTEM
DD	DD-CD-005	AERIAL STRUCTURE BRIDGE DECK, DRAINAGE INLET DETAIL

UTILITY		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-UT-001	UTILITY CROSSING CLEARANCES, AT GRADE
DD	DD-UT-002	UTILITY CROSSING CLEARANCES, RETAINED CUT TRENCH
DD	DD-UT-004	UTILITY CROSSING CLEARANCES, TRENCH
DD	DD-UT-004	UTILITY CROSSING CLEARANCES, CUT AND COVER TUNNELS

INTRUSION PROTECTION		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-IP-001	EARTHWORK BERM, RAILROAD ADJACENT TO HST
DD	DD-IP-002	BARRIERS IN SHARED CORRIDOR
DD	DD-IP-003	HST PIER PROTECTION, IN RAILROAD RIGHT-OF-WAY
DD	DD-IP-004	IN SHARED AND ADJACENT CORRIDOR, AT-GRADE
DD	DD-IP-005	AT-GRADE BERM OR DITCH ON HST GUIDEWAY, RAILROAD ADJACENT TO HST
DD	DD-IP-006	HST PIER PROTECTION, IN HIGHWAY/ROADWAY RIGHT-OF-WAY
DD	DD-IP-007	HST TRENCH AND RETAINING WALL PROTECTION
DD	DD-IP-008	ADJACENT TO HIGHWAY/ROADWAY

STRUCTURE		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-ST-001	AERIAL STRUCTURE, TWO TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK
DD	DD-ST-002	AERIAL STRUCTURE, ONE TRACK NON-BALLASTED, TYPICAL CONFIGURATION ON TOP OF DECK
DD	DD-ST-003	AERIAL STRUCTURE, TYPICAL CABLE TROUGH DETAILS
DD	DD-ST-004	AERIAL STRUCTURE, CABLE TROUGH DETAILS, AT OCS POLE
DD	DD-ST-005	AERIAL STRUCTURE, CONCRETE PARAPET
DD	DD-ST-006	AERIAL STRUCTURE, TYPICAL SPAN, SHEAR KEY DETAILS
DD	DD-ST-007	AERIAL STRUCTURE,TYPICAL SPAN, EXPANSION JOINT DETAILS
DD	DD-ST-008	AERIAL STRUCTURE, EMERGENCY EXIT STAIRWAY DETAILS 1
DD	DD-ST-009	AERIAL STRUCTURE, EMERGENCY EXIT STAIRWAY DETAILS 2
DD	DD-ST-010	TYPICAL CROSS SECTION, TWO TRACK TRENCH, OUTSIDE WALKWAY
DD	DD-ST-011	CABLE TROUGH DETAILS, TRENCH / CUT AND COVER TUNNEL
DD	DD-ST-012	CABLE TROUGH LAYOUT TRANSITION AREAS
DD	DD-ST-013	TYPICAL CABLE TROUGH DETAILS, EMBANKMENT/CUT
DD	DD-ST-014	RETAINING WALL, LAYOUT AND DETAILS

SYSTEM OVERALL		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-SY-010	TYPICAL CIVIL ACCOMMODATIONS, SYSTEM SITES

TRACTION POWER		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-TP-D401	CONCEPTUAL LOCATIONS OF, TRACTION POWER FACILITIES
DD	DD-TP-F101	TYPICAL SINGLE CATENARY, FEEDING GANTRY ARRANGEMENT
DD	DD-TP-F102	TYPICAL DOUBLE CATENARY, FEEDING GANTRY ARRANGEMENT
DD	DD-TP-F103	TYPICAL CROSS SECTION, SYSTEMS 25 KV, UNDERGROUND CONDUIT DUCTBANK, AT-GRADE
DD	DD-TP-N101	TYPICAL 25KV DUCTBANK DETAILS
DD	DD-TP-N111	TYPICAL 25KV MANHOLE DETAILS

OVERHEAD CONTACT SYSTEM		
TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-OC-2046	TYPICAL GROUNDING AND BONDING ARRANGEMENT, GRADE SEPARATED STRUCTURE, 220 MPH SEGMENT
DD	DD-OC-2047	TYPICAL GROUNDING AND BONDING ARRANGEMENT, AERIAL STRUCTURE, 220 MPH SEGMENT
DD	DD-OC-2048	TYPICAL GROUNDING AND BONDING ARRANGEMENT, CUT AND COVER TUNNEL, 220 MPH SEGMENT
DD	DD-OC-2049	GROUNDING AND BONDING ARRANGEMENT, OPEN TRENCH, 220 MPH SEGMENT

COMMUNICATIONS		
DRAWING TYPE	DRAWING NO.	DRAWING TITLE
DD	DD-CO-G021	TYPICAL CROSS SECTION, SYSTEMS LOW-VOLTAGE, CONDUIT DUCT BANK,
DD	DD-CO-G022	TYPICAL CROSS SECTION, SYSTEMS LOW-VOLTAGE, UNDER TRACK CONDUCT DUCT BANK, AT-GRADE
DD	DD-CO-G023	TYPICAL SYSTEMS LOW-VOLTAGE, UNDERGROUND CONDUIT DUCT BANK INSTALLATIONS, AT TRENCH SECTIONS
DD	DD-CO-G024	TYPICAL SYSTEMS LOW-VOLTAGE, UNDERGROUND CONDUIT DUCT BANK INSTALLATIONS, AT TRENCH SECTIONS

A	05/31/13					EXECUTION VERSION
REV	DATE	BY	CHK	APP		DESCRIPTION

DESIGNED BY R. MINCIO
DRAWN BY V. HUANTE
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 07/12/2013

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CALIFORNIA HIGH-SPEED TRAIN PROJECT SIERRA SUBDIVISION
DIRECTIVE DRAWINGS CONTRACT PACKAGE 1 SHEET INDEX

CONTRACT NO.
DRAWING NO. INDEX-1 CP1
SCALE NO SCALE
SHEET NO.

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CIVIL DIRECTIVE NOTES

A. GENERAL SITE NOTES

- 1. FIELD VERIFY ALL EXISTING SITE CONDITIONS PRIOR TO THE COMMENCEMENT OF WORK AND REPORT ANY DISCREPANCIES TO THE AUTHORITY’S REPRESENTATIVE.
- 2. ALL CONSTRUCTION ACTIVITIES AFFECTING THIRD PARTY FACILITIES SHALL BE COORDINATED WITH THE PROPER JURISDICTION AUTHORITY.
- 3. FOR ABBREVIATIONS, SEE GENERAL DIRECTIVE DRAWINGS.
- 4. FOR SYMBOLS, SEE GENERAL DIRECTIVE DRAWINGS.
- 5. "ORIGINAL GROUND" SHOWN ON CROSS SECTIONS REFERS TO THE APPROXIMATE EXISTING GROUND LINE AT THE DESIGNATED CENTERLINE, BASELINE, LAYOUT LINE OR SECTION LINE.
- 6. ALL WORK SHALL CONFORM TO ALL LOCAL, STATE AND FEDERAL CODES AND ORDINANCES IN EFFECT.
- 7. PROVIDE AND MAINTAIN PROPER BARRICADES, RAILINGS, GUARDS, FLAGGING, LIGHTING, OR OTHER DEVICES NECESSARY FOR THE PROTECTION OF LIFE AND PROPERTY.
- 8. VERIFY ALL CONTROLLING FIELD DIMENSIONS BEFORE ORDERING OR FABRICATING MATERIALS.

B. GRADING

- 1. DO NOT PERFORM ANY GRADING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR THE CONTRACTOR MAY BE CITED AND THE CONTRACTOR SHALL IMMEDIATELY MAKE ALL REMEDIAL ACTIONS NECESSARY.
- 2. KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE.
- 3. PROVISIONS SHALL BE MADE TO PREVENT SURFACE WATERS FROM DAMAGING THE CUT FACE OF AN EXCAVATION OR THE SLOPED SURFACES OF A FILL. FURTHERMORE, PROVISIONS SHALL BE MADE TO PREVENT SEDIMENT-LADEN RUNOFF FROM LEAVING THE SITE.
- 4. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
- 5. ALL GRADING OPERATIONS SHALL BE PERFORMED IN CONFORMANCE WITH THE APPLICABLE PROVISIONS OF THE WATER POLLUTION CONTROL AND WATER QUALITY STANDARDS CONTAINED IN THE LATEST CALTRANS STORM WATER QUALITY HANDBOOKS.

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DESIGNED BY S. MILITELLO
DRAWN BY R. MINCIO
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 07/12/2013



CALIFORNIA HIGH-SPEED TRAIN PROJECT GENERAL DIRECTIVE
GENERAL DIRECTIVE NOTES CIVIL

CONTRACT NO.
DRAWING NO. DD-GE-001
SCALE NO SCALE
SHEET NO.

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TRACK DIRECTIVE NOTES

1. THE GENERAL BASIS FOR TRACK STANDARDS AND MATERIALS SHALL BE THE AREMA MANUAL.
2. TRACK AND TRACK COMPONENTS SHALL BE DESIGNED AND FABRICATED TO PERFORM UNDER THE PREVAILING AND EXTREME CLIMATIC AND ENVIRONMENTAL CONDITIONS OCCURRING WITHIN THE GEOGRAPHIC EXTENT OF THE SYSTEM.
3. THE PROFILE GRADE LINE IS CARRIED ON THE TOP OF LOW RAIL THROUGH HORIZONTAL CURVES AND SPIRALS FOR THE DESIGNATED TRACK.
4. THE LENGTHS OF TRACK IS BASED ON CENTER OF TRACK ALIGNMENT.
5. UNLESS SEPARATE TRACK PROFILES ARE GIVEN, TRACK PARALLEL TO THE DESIGNATED TRACK ARE AT THE SAME TOP OF RAIL ELEVATIONS PROJECTED ON EITHER PERPENDICULAR OR RADIAL LINES FROM THE DESIGNATED TRACK CENTERLINES.
6. BALLASTED TRACKS ARE GENERALLY PREFERRED FOR YARD TRACKS. DESIGNERS SHALL FOLLOW THE REQUIREMENTS ASSOCIATED WITH CONSTRUCTION OF BALLASTED TRACK IN THE CALIFORNIA HIGH SPEED TRAIN DESIGN MANUAL.

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IN CHARGE J. CHIRCO
DATE 07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
GENERAL DIRECTIVE

GENERAL DIRECTIVE NOTES
TRACK

CONTRACT NO.
DRAWING NO. DD-GE-002
SCALE NO SCALE
SHEET NO.

CONTRACT NO.	13259
DRAWING NO.	DD-GE-003
SCALE	NO SCALE
SHEET NO.	

A	
@	AT
A&E	ARCHITECTURAL AND ENGINEERING
A/G	AT-GRADE
AADT	AVERAGE ANNUAL DAILY TRAFFIC
AB	AGGREGATE BASE,
	ANCHOR BOLT
ABBC	ASBESTOS BONDED BITUMINOUS COATED
ABM	AIR-BLOWN MORTAR
ABN	ABANDON
ABUT	ABUTMENT
ABV	ABOVE
AC	ALTERNATING CURRENT,
	ASPHALT CONCRETE
ACB	ASPHALT CONCRETE BASE
ACMB	AC DISTRIBUTION PANEL MAIN BREAKER
ACOUS	ACOUSTICAL
ACP	ASBESTOS CEMENT PIPE
ACS	ACCESS CONTROL ROOM
ACSR	ALUMINUM CONDUCTOR STEEL REINFORCED
AD	AREA DRAIN
ADJ	ADJACENT,
	ADJUST,
	ADJUSTABLE
ADL	ADDED DEAD LOAD
ADP	AC DISTRIBUTION PANEL
ADT	AVERAGE DAILY TRAFFIC
AEC	AERIAL EARTH (GROUND) CONDUCTOR
AED	AUTOMATED EXTERNAL DEFIBRILLATOR
AFC	AUTOMATIC FARE COLLECTION
AFES	ALTERNATIVE FLARED END SECTION
AGW	AERIAL GROUND WIRE
AHD	AHEAD
AL	ALUMINUM
ALIGN	ALIGNMENT
ALT	ALTERNATE
AM	TIME FROM MIDNIGHT TO NOON
ANC	ANCHOR
ANI	AUTOMATIC NUMBER IDENTIFICATION
ANN	ANNUNCIATOR
ANS	AMBIENT NOISE SENSOR
AP	ALTERNATIVE PIPE
APC	ALTERNATIVE PIPE CULVERT
APE	AREA OF POTENTIAL EFFECTS
APEFZ	ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE
API	APPLICATION PROGRAMMING INTERFACE
APPROX	APPROXIMATE
APU	ALTERNATIVE PIPE UNDERDRAIN
AR	ACCESS RESTRICTION
ARCH	ARCHITECTURAL
ARS	ACCELERATION RESPONSE SPECTRUM
AS	AGGREGATE SUBBASE
ASPH	ASPHALT
ASRP	ALUMINUM SPIRAL RIB PIPE
ASSY	ASSEMBLY
AT	AUTOTRANSFORMER,
	AUTOMATIC TENSION
ATC	AUTOMATIC TRAIN CONTROL
ATEL	ADMINISTRATIVE TELEPHONE
ATM	ALONG TRACK MOVEMENT
ATO	AUTOMATIC TRAIN OPERATION
ATP	AUTOMATIC TRAIN PROTECTION
ATPB	ASPHALT TREATED PERMEABLE BASE
ATPM	ASPHALT TREATED PERMEABLE MATERIAL
ATR	ABOVE TOP OF RAIL
ATS	AUTOMATIC TRAIN SUPERVISION,
	AUTOTENSIONED SYSTEM
AUX	AUXILIARY
AVE	AVENUE
AVG	AVERAGE
AVL	AUTOMATIC VEHICLE LOCATION
AWG	AMERICAN WIRE GAUGE

B	
B/SPAN	BODY SPAN
B/W	BLACK & WHITE
BAGR	BRIDGE APPROACH GUARD RAILING
BAR	BARRIER
BAT	BATTERY
BB	BEGINNING OF BRIDGE
B-B	BACK-TO-BACK
BC	BOLT CIRCLE

B CONTINUED	
BCR	BEGIN CURB RETURN
BD	BOARD
BDA	BI-DIRECTIONAL AMPLIFIER
BDD	BRIDGE DESIGN DETAILS (CALTRANS)
BDP	BRIDGE DESIGN PRACTICE (CALTRANS)
BDS	BRIDGE DESIGN SPECIFICATIONS (CALTRANS)
BEC	BURIED EARTH (GROUND) CONDUCTOR
BEG	BEGIN
BFA	BY PASS FEEDER ANCHOR
BIL	BASIC IMPULSE INSULATION LEVEL
BITUM	BITUMINOUS
BK	BACK
BKF	BACKFILL
BKR	BREAKER
BL	BASE LINE
BLDG	BUILDING
BLKG	BLOCKING
BLM	BRIDGE-LOG MILE
BLST	BALLAST
BLVD	BOULEVARD
BM	BENCH MARK
BN	BACKBONE NETWORK
BND	BOUND
BOC	BOTTOM OF CURB
BOCC	BACK-UP OPERATIONAL CONTROL CENTER
BOS	BOTTOM OF SLOPE
BOT	BOTTOM
BOW	BOTTOM OF WALL
BR	BRIDGE
BRG	BEARING
BRKT	BRACKET
BRS	BROADBAND RADIO SYSTEM
BRT	BUS RAPID TRANSIT
BS	BODY SPAN WIRE
BSC	BASE STATION CONTROLLER
BT	BUS TIE
BTM	BOTTOM
BTS	BASE TRANSCEIVER STATION
BTWN	BETWEEN
BW	BARBED WIRE,
	BALANCE WEIGHT
BWA	BALANCE WEIGHT ANCHOR
BWLAN	BROADBAND WIRELESS LOCAL AREA NETWORK
BZ	BRONZE

C	
C	CLOSE,
	CONTACT,
	CONTROL
CA	CERTIFICATION ACCEPTANCE
CAA	CABLE ANCHOR ASSEMBLY
CAB	CABINET
CADD	COMPUTER-AIDED DESIGN AND DRAFTING
CAH	CONTROLLED ACCESS HIGHWAY
CAI	CUSTOMER ASSISTANCE INTERCOM
CALP	CORRUGATED ALUMINUM PIPE
CANT	CANTILEVER
CAP	CAPACITY,
	CAPACITOR,
	CORRUGATED ALUMINUM PIPE
	CORRUGATED ALUMINUM PIPE ARCH
CAPA	CONSTRUCTION AREA SIGN
CAS	CATEGORY,
CAT	CATEGORY SPECIFICATION FOR
	TWISTED PAIR CABLING,
	CATENARY
CATF	CANTENARY FOUNDATION
CATP	CATENARY POLE
CB	CATCH BASIN,
	CIRCUIT BREAKER
CBTC	COMMUNICATIONS BASED TRAIN CONTROL
CBW	CONCRETE BLOCK WALL
C-C	CENTER LINE TO CENTER LINE
CCO	CONTRACT CHANGE ORDER
CCS	CALIFORNIA COORDINATE SYSTEM
CCTV	CLOSED CIRCUIT TELEVISION
CCVT	COUPLING CAPACITOR VOLTAGE TRANSFORMER
CEG	CERTIFIED ENGINEERING GEOLOGIST

C CONTINUED	
CEM	CEMENT
CER	COMMUNICATIONS EQUIPMENT ROOM
C&G	CURB & GUTTER
CG	CENTER OF GRAVITY
CGS	CALIFORNIA GEOLOGICAL SURVEY
CHNL	CHANNEL
CI	CAST IRON
CIC	COMMUNICATIONS INTERFACE CABINET
CIDH	CAST-IN-DRILLED-HOLE
CIF	COMMON INTERMEDIATE FORMAT
CIP	CAST IRON PIPE
C-I-P	CAST-IN-PLACE
CIPCP	CAST-IN-PLACE CONCRETE PIPE
CIS	CUSTOMER INFORMATION SIGN
CISS	CAST-IN-STEEL-SHELL
CJ	CONSTRUCTION JOINT
CJP	COMPLETE JOINT PENETRATION
CKT	CIRCUIT
CL	CLASS
CL2	CLASS 2
CL-6	CHAIN LINK FENCE (6 FT)
CLG	CEILING
CLK	CHAIN LINK
CLKG	CAULKING
CLO	CLOSET
CLR	CLEAR,
	CLEARANCE
CM	CONTROL MODULE,
	CORRUGATED METAL
CMP	CORRUGATED METAL PIPE
CMU	CONCRETE MASONRY UNIT
CNTR	COUNTER
CO	CLEANOUT,
	COUNTY
COL	COLUMN
COMM	COMMUNICATIONS
CONC	CONCRETE
COND	CONDUIT
CONN	CONNECTOR,
	CONNECTION
CONST	CONSTRUCT,
	CONSTRUCTION
CONT	CONTINUOUS,
	CONTINUATION
CONTR	CONTRACTOR
COORD	COORDINATE
CORR	CORRIDOR
CP	CONTROL POINT
CPT	CONE PENETRATION TEST,
	CONTROL POWER TRANSFORMER
	CENTRAL PROCESSING UNIT
CPU	CREEK,
CR	CONDUIT RISER
CRC	COMBINED RELAY AND CONTROL PANEL
CRCP	CONTINUOUS REINFORCED CONCRETE PAVEMENT
CRSP	CONCRETED ROCK SLOPE PROTECTION
CRZ	CLEAR RECOVERY ZONE
CS	CONTROL SWITCH
CSA	CONSTRUCTION STAGING AREA
CSP	CORRUGATED STEEL PIPE
CSPA	CORRUGATED STEEL PIPE ARCH
CT	CERAMIC TILE,
	COURT,
	CURRENT TRANSFORMER/TRANSDUCER
CTB	CEMENT TREATED BASE
CTPB	CEMENT TREATED PERMEABLE BASE
CTPM	CEMENT TREATED PERMEABLE MATERIAL
CTR	CENTER
CTSK	COUNTERSUNK
CTVT	COMBINED CURRENT TRANSFORMER AND
	VOLTAGE TRANSFORMER
CTW	COUNTERWEIGHT TAIL WIRE
CU	COPPER
CULV	CULVERT
CV	CURVE
CVR	COVER
CW	CONTACT WIRE
CWA	CONTACT WIRE ANCHOR
CWH	CONTACT WIRE HEIGHT
CWR	CONTINUOUSLY WELDED RAIL
CWT	COUNTER WEIGHT

D	
D	DEPTH
DB	DESIGN-BUILD
DBE	DESIGN BASIS EARTHQUAKE
DBL	DOUBLE
DC	DIRECT CURRENT
DCMB	Dc DISTRIBUTION PANEL MAIN BREAKER
DCP	Dc DISTRIBUTION PANEL
DD	DOWNDRAIN,
	DEVICE DRIVER
DE	DEAD END
DEL	DELINEATOR
DEMO	DEMOLISH
DEPT	DEPARTMENT
DET	DETOUR
DF	DIRECT FIXATION,
	DRINKING FOUNTAIN
DGA	DOWN GUY ANCHOR
DHV	DESIGN HOURLY VOLUME
DI	DRAINAGE INLET
DIAG	DIAGONAL
DIAPH	DIAPHRAGM
DIFF	DIFFERENTIAL
DIM	DIMENSION
DIN	DROP INLET
DIR	DIRECTION
DISC	DISCONNECT
DISP	DISPENSER
DIST	DISTANCE
DISTR	DISTRIBUTION
DMBB	DOUBLE METAL BEAM BARRIER
DN	DOWN
DNS	DOMAIN NAME SYSTEM
DO	DOOR OPENING
DPDT	DOUBLE-POLE DOUBLE-THROW
DR	DRIVE
DS	DOWNSPOUT,
	DISCONNECT SWITCH
DSC	DIFFERING SITE CONDITIONS
DSCW	DIRECT SUSPENSION CONTACT WIRE
DSG	DISCONNECT SWITCH GROUP
DSHA	DETERMINISTIC SEISMIC HAZARD ANALYSIS
DST	DISTRICT
DTBB	DOUBLE THRIE BEAM BARRIER
DTM	DIGITAL TERRAIN MODEL
DVR	DIGITAL VIDEO RECORDERS
DWG	DRAWING
DWY	DRIVEWAY
DXO	DOUBLE CROSSOVER

E	
E	EAST
EA	EACH
EB	EASTBOUND,
	END OF BRIDGE
EC	END HORIZONTAL CURVE,
	ELECTRICAL CONDUCTOR
	END CURB RETURN
ECR	EACH END
EE	EACH FACE
EF	EMERGENCY GROUND SWITCH
EGS	EXTRA HIGH STRENGTH
EHS	EMERGENCY INTERCOM
EI	EXPANSION JOINT
EJ	ETHERNET LAN
E-LAN	ELASTOMERIC
ELAST	ELECTRICAL,
ELEC	ELECTRIC
	ELECTROLIER
ELECT	ELEVATION
ELEV	ELECTRONIC LOCK
ELOCK	EMBANKMENT
EMB	ELECTROMAGNETIC COMPATIBILITY
EMC	EMERGENCY
EMER	ELECTROMAGNETIC FIELD
EMF	ELECTRO MAGNETIC INTERFERENCE
EMI	ELEMENT MANAGEMENT SYSTEM
EMS	ELECTRIC MULTIPLE UNIT
EMU	ENCLOSURE
ENCL	ENGINEER,
ENGR	ENGINEERING
EOB	END OF BRIDGE

A	05/31/13				EXECUTION VERSION
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DRAWN BY	V. HUANTE
CHECKED BY	S. MILITELLO
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PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY


CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING


ACRONYMS AND ABBREVIATIONS 1

CONTRACT NO.
DRAWING NO. DD-GE-100
SCALE NO SCALE
SHEET NO.

[illegible]

						DESIGNED BY R. MINCIO
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						IN CHARGE J. CHIRCO
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**CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING**

ACRONYMS AND ABBREVIATIONS 2

CONTRACT NO.

DRAWING NO.
DD-GE-101

SCALE
NO SCALE

SHEET NO.

HSR 13-06 - EXECUTION VERSION

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T CONTINUED

W CONTINUED

TRACK GEOMETRY - HORIZONTAL

UNITS OF MEASUREMENT

TTC TWO TRACK CANTILEVER
TTEL TRAIN EMERGENCY SPEAKERPHONE
TV TELEVISION
TVM(S) TICKET VENDING MACHINE(S)
TW TIE WIRE
TYP TYPICAL

WS WATER SURFACE,
WORK STATION
WSP WELDED STEEL PIPE
WT WEIGHT
WV WATER VALVE
WW WINGWALL,
WALKWAY
WWF WELDED WIRE FABRIC
WWLOL WINGWALL LAYOUT LINE
WWM WELDED WIRE MESH

BC BEGIN HORIZONTAL CURVE
CC COMPOUND CURVE
CS POINT OF CHANGE FROM CIRCULAR CURVE TO SPIRAL
K1 TANGENT DISTANCE PF SHIFT PC
REFERENCE TO THE TS
K2 TANGENT DISTANCE PF SHIFT PT
REFERENCE TO THE ST

Ac ACRES
AMP AMPERES
BTU BRITISH THERMAL UNIT
CAL CALIPER
CF CUBIC FEET
CP CANDLE POWER
CY CUBIC YARD

U

X

U/S UNDERSIDE
UB UTILITY BOX
UC UNDERCROSSING
UD UNDERDRAIN
UG UNDERGROUND,
UNDER GRADE
UGB UNDERGRADE BRIDGE
UI USER INTERFACE
UNF UNFINISHED
UNINS UNINSULATED
UON UNLESS OTHERWISE NOTED
UP UNDERPASS
UPS UNINTERRUPTIBLE POWER SUPPLY
UR URINAL
UrEDAS URGENT EARTHQUAKE DETECTION AND
ALARM SYSTEM
USCS UNITED SOIL CLASSIFICATION SYSTEM
UTIL UTILITY
UTP UNSHIELDED TWISTED PAIR
UWP UPPER WORKING POINT

X/CAT CROSS CANTENARY
X/SPAN CROSS SPAN
XD TRANSDUCER
XFMR TRANSFORMER
XO CROSSOVER
XO ST CROSSOVER SPRING TENSIONER
XSEC CROSS SECTION
XING CROSSING
XMITTER TRANSMITTER

Lc LENGTH OF CIRCULAR CURVE
Ls1 LENGTH OF SPIRAL
Ls2 LENGTH OF SPIRAL FROM TS TO SC
LSc LENGTH OF SPIRAL FROM CS TO ST
LVC LENGTH OF COMPOUND SPIRAL FROM CS TO SC
p1 OFFSET FROM INITIAL TANGENT TO PC OF THE SHIFTED
CIRCLE OF SPIRALIZED CURVE
p2 OFFSET FROM INITIAL TANGENT TO PT OF THE SHIFTED
CIRCLE OF SPIRALIZED CURVE
PC POINT OF CURVATURE
PCC POINT OF COMPOUND CURVE
PF POINT OF FROG
PI POINT OF INTERSECTION
PITO POINT OF INTERSECTION TURNOUT
POC POINT ON HORIZONTAL CURVE
POE POINT OF ENDING
POS POINT ON SPIRAL,
POVC POINT ON VERTICAL CURVE
POVT POINT ON VERTICAL TANGENT
PRC POINT OF REVERSE CURVE
PRVC POINT OF REVERSE VERTICAL CURVE
PS POINT OF SWITCH
PT POINT OF TANGENT

dB DECIBEL
DEG DEGREE
DIA DIAMETER
Eu UNBALANCED SUPERELEVATION
F FARENHEIT
FT FOOT,
FEET
g ACCELERATION DUE TO GRAVITY
GA GAUGE
GAL GALLON
GB GIGABYTE
GBPS GIGABITS PER SECOND
GHZ GIGAHERTZ
HR HOUR
HT HEIGHT
HZ HERTZ
ID INSIDE DIAMETER
IF INSIDE FACE
IN INCHES
IR INSIDE RADIUS

V

V DESIGN SPEED,
VALVE
VAC VOLTS ALTERNATING CURRENT
VAR VARIABLE,
VARIES,
VOLT-AMPERE REACTIVE
VCAT VIRTUAL CONCATENATION
VCP VITRIFIED CLAY PIPE
VCT VINYL COMPOSITION TILE
VDC VOLT DC
VE VALUE ENGINEERING
VERT VERTICAL
VEST VESTIBULE
VIA VIADUCT
VLAN VIRTUAL LOCAL AREA NETWORK
VMS VARIABLE MESSAGE SIGN,
VARIABLE MESSAGE SYSTEM,
VOLTIMETER
VOLUME
VOIP VOICE OVER INTERNET PROTOCOL
VPN VIRTUAL PRIVATE NETWORK
VRCS VOICE RADIO COMMUNICATIONS SYSTEM
VS VOLTAGE SWITCH
VT VOLTAGE TRANSFORER/TRANSDUCER

SC POINT OF CHANGE FROM SPIRAL TO
CIRCULAR CURVE
SPO POINT ON ORIGIN OF COMPOUND SPIRAL
SS POINT OF CHANGE BETWEEN SPIRALS
SSC SPIRAL TO SPIRAL POINT OF CURVATURE
ST POINT OF CHANGE FROM SPIRAL TO TANGENT

K KIPS (1000 POUNDS)
KCMIL THOUSAND CIRCULAR MILS
KHZ KILOHERTZ
KSF KIPS PER SOAURE FOOT
KSI KIPS PER SQUARE INCH
kV KILOVOLTS
KVA KILOVOLT-AMPERE
KVAR KILOVOLT-AMPERE REACTIVE
KW KILOWATT
KWH/D KILOWATT HOUR / DEMAND

TC POINT OF CHANGE FROM TANGENT TO CURVE
TS POINT OF CHANGE FROM TANGENT TO SPIRAL
Ts1 TANGENT DISTANCE FROM TS TO PI
Ts2 TANGENT DISTANCE FROM ST TO PI

L LENGTH
LB POUNDS
LB/FT POUNDS PER FOOT
LF LINEAR FEET

Xs1 TANGENT OFFSET AT THE SC
Xs2 TANGENT OFFSET AT THE CS
Ys1 TANGENT DISTANCE AT THE SC
Ys2 TANGENT DISTANCE AT THE CS

Δ TOTAL CENTRAL ANGLE OF THE SPIRALIZED CURVE
Δc CENTRAL ANGLE OF CIRCULAR CURVE (Lc) FROM
SC TO CS
Δc1 CENTRAL ANGLE OF FIRST CIRCULAR CURVE OF
COMPOUND CURVATURE
Δc2 CENTRAL ANGLE OF SECOND CIRCULAR CURVE OF
COMPOUND CURVATURE
θs1 CENTRAL ANGLE OF SPIRAL LENGTH Ls1 OR SPIRAL
ANGLE OF FIRST SPIRAL IN SPIRALIZED CURVE
θs2 CENTRAL ANGLE OF SPIRAL LENGTH Ls2 OR SPIRAL
ANGLE OF SECOND SPIRAL IN SPIRALIZED CURVE
θsc CENTRAL ANGLE OF COMPOUND SPIRAL OR COMPOUND
SPIRAL ANGLE FROM CS TO SC

m METER
MBPS MEGA-BITS PER SECOND
MCM THOUSAND CIRCULAR MILS
MHZ MEGAHERTZ
mm MILLIMETER
MPH MILES PER HOUR
MVA MEGAVOLT-AMPERE
MW MEGA WATT

OD OUTSIDE DIAMETER

PSF POUNDS PER SQUARE FOOT
PSI POUNDS PER SQUARE INCH
PSIG POUNDS PER SQUARE INCH GAUGE

TRACK GEOMETRY - VERTICAL

BVC BEGIN VERTICAL CURVE
Ea ACTUAL SUPERELEVATION
EVC END VERTICAL CURVE

SEC SECOND
SF SQUARE FEET
SY SQUARE YARD

TF TRACK FEET

VA VOLTS
VAC VOLT-AMPERE

PCVC POINT OF COMPOUND VERTICAL CURVE
POVC POINT OF VERTICAL INTERSECTION
POVT POINT ON VERTICAL CURVE
PVI POINT ON VERTICAL TANGENT

Y YARDS
YR(S) YEAR(S)

VC VERTICAL CURVE
VPI VERTICAL POINT OF INTERSECTION

W

W WEST,
WIDTH
W/ WITH
W/O WITHOUT
WA WORK AREA
WB WESTBOUND
WC WATER CLOSET
WCS WIRELESS COMMUNICATIONS SYSTEM
WD WOOD
WLAN WIRELESS LOCAL AREA NETWORK
WM WIRE MESH
WP WORK POINT,
WOOD POLE
WPF WATERPROOF
WPC WAYSIDE POWER CUBICLES
WR WIRE RUN
WRT WITH RESPECT TO

DESIGNED BY
R. MINCIO
DRAWN BY
V. HUANTE
CHECKED BY
S. MILITELLO
IN CHARGE
J. CHIRCO
DATE
07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
DIRECTIVE DRAWING

ACRONYMS AND ABBREVIATIONS 4

CONTRACT NO.

DRAWING NO.
DD-GE-103

SCALE
NO SCALE

SHEET NO.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION


06/14/2013 HSB 13-06 - EXECUTION VERSION

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Huante

TRACK					CIVIL					CIVIL CONTINUED					CIVIL CONTINUED				
EXISTING FREIGHT/PASSENGER TRACK					AGGREGATE BASE					ELEVATIONS					PARKING METER				
HST TRACK					ASPHALT CONCRETE					ELEVATION (EXISTING)					POINT OF INTERSECTION				
BALLAST					BEGIN OR END PLATFORM					ELECTROLIER, ELECTROLIER ON POLE					POINT OF INTERSECTION SYMBOL				
BUMPER/BUMPING POST					BIKE STAND					EXISTING GUARD RAILING					POINT OF VERTICAL INTERSECTION				
CONCRETE					BREAK LINE					EXISTING WALL					POWER POLE				
DERAIL-DENOTES DERAIL DIRECTION AND LOCATION OF SWITCH MACHINE (LEFT-HAND SHOWN)					BORINGS (EXISTING)					FENCE					RETAINING WALL				
DOUBLE Crossover					CENTERLINE					FIRE HYDRANT					RIVER, STREAMS, AND CREEKS				
EARTH					CENTERLINE TEXT SYMBOL					GRADED/LANDSCAPED AREA					SECTION DESIGNATION (LETTER)				
FRICTION BUFFER					CLEAN OUT					GAS METER					DRAWING NO. ON WHICH SECTION AND DETAIL APPEARS				
INSULATED JOINT					COLUMN, BENT					GAS VALVE					SECTION OR DETAIL TITLE				
INSULATED JOINT LOCATIONS-BOTH RAIL					CONCRETE					GUARD POST					SPOT ELEVATION				
INSULATED JOINT LOCATIONS-LEFT RAIL					CONCRETE BARRIER					GUARD RAIL					TILDE (TERMINATOR)				
INSULATED JOINT LOCATIONS-RIGHT RAIL					CONTOUR LINE					GRAVEL OR DIRT ROAD					STATION EQUATION				
POINT OF CURVATURE					CONTROL PANEL					GUY WIRE					STREET LIGHT				
POINT OF SWITCH-DENOTES SWITCH MACHINE LOCATION					CONTROL POINT OR STREET INTERSECTION POINT					HIGH MASS LIGHTING					STREET LIGHT POWER POLE				
PREPARED SUBGRADE					COORDINATE GRID CROSSHAIR					HORIZONTAL & VERTICAL CONTROL MONUMENT					STREET LIGHT TRAFFIC SIGNAL				
RAIL LUBRICATOR-DIRECTION OF TRAVEL, (DT), TWO RAIL LUBRICATORS SHOWN					CURB WITH GUTTER (CURB-LIP, FLOW LINE, BACK-TOP OF CURB)					HORIZONTAL CONTROL MONUMENT					STREET SIGN				
SINGLE Crossover (LEFT-HAND SHOWN)					CURVE NUMBER					ICV					STRUCTURE CLEARANCE ENVELOPE				
SPECIAL RAIL					CURVE NUMBER (TRACK GEOMETRY)					MAIL BOX					SUPER AXIS OF ROTATION				
STANDARD BOLTED JOINT					TANGENT NUMBER					MANHOLE					TELEPHONE BOOTH				
STANDARD RAIL					DITCH FLOW LINE					MATCH LINE					TELEPHONE POLE				
SUB BALLAST					DOUBLE THRIE BEAM BARRIER					NEW ASPHALTIC CONCRETE					TEMPORARY RAILING (TYPE K)				
TURNOUT (RIGHT-HAND SHOWN)					DROP INLET					NEW GUARD RAILING					TIRE DERIVED AGGREGATE				
WELDED JOINT					ROUND DROP INLET					NEWS STAND					TRACK ALIGNMENT CENTER LINE				
CONTROL POINT (CP)					DETENTION BASIN					NORTH ARROW					TRAFFIC PANEL				
WALKWAY ENVELOPE					EARTHWORK LIMITS					ORIGINAL GROUND					TRAFFIC SIGNAL				
															TRANSMISSION TOWER				
															TREE				
															UTILITY POLE				

					DESIGNED BY R. MINCIO					<div>PARSONS BRINCKERHOFF</div> <div> CALIFORNIA HIGH-SPEED RAIL AUTHORITY</div>	<div>CALIFORNIA HIGH-SPEED TRAIN PROJECT STANDARD DRAWING</div> <div>SYMBOLS 1</div>	CONTRACT NO. 13259								
					DRAWN BY V. HUANTE							DRAWING NO. DD-GE-110								
					CHECKED BY S. MILITELLO							SCALE NO SCALE								
					IN CHARGE J. CHIRCO							SHEET NO.								
A 05/31/13					DATE 07/12/2013															
REV	DATE	BY	CHK	APP	DESCRIPTION															
					EXECUTION VERSION															

05/14/2013
HSR 13-06 - EXECUTION VERSION

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Huante

CIVIL CONTINUED

POLE AND WIRES



POLE WITH WIRES AND ANCHOR



VALVE



VENT



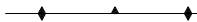
VERTICAL CONTROL MONUMENT



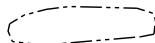
WALL



WALL ON BARRIER



WATER EDGE, LAKE, POND, SWAMP



WATER METER



WELL



YARD BOX ELECTRICAL



RIGHT-OF-WAY

PROPOSED RIGHT-OF-WAY

PROP ROW

EXISTING EASEMENT



PROPOSED TEMPORARY
CONSTRUCTION EASEMENT

PROP TCE



AERIAL UTILITIES

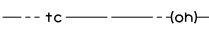
EXIST ELECTRICAL



EXIST FIBER OPTIC



EXIST TELEMETER CABLE



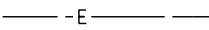
EXIST TELEPHONE



EXIST TELEVISION



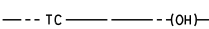
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NEW FIBER OPTIC



NEW TELEMETER CABLE



NEW TELEPHONE

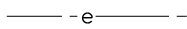


NEW TELEVISION

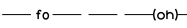


UNDERGROUND UTILITIES

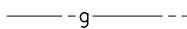
EXIST ELECTRICAL



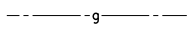
EXIST FIBER OPTIC



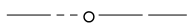
EXIST GASOLINE



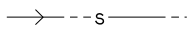
EXIST NATURAL GAS



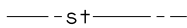
EXIST OIL



EXIST SEWER



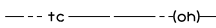
EXIST STEAM



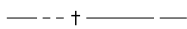
EXIST STORM DRAIN



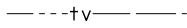
EXIST TELEMETER CABLE



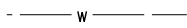
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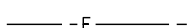
EXIST TELEVISION



EXIST WATER



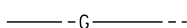
NEW ELECTRICAL



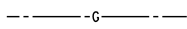
NEW FIBER OPTIC



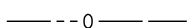
NEW GASOLINE



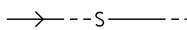
NEW NATURAL GAS



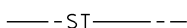
NEW OIL



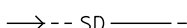
NEW SEWER



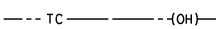
NEW STEAM



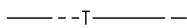
NEW STORM DRAIN



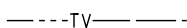
NEW TELEMETER CABLE



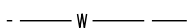
NEW TELEPHONE



NEW TELEVISION



NEW WATER



TRACTION POWER

SINGLE-POLE MOTOR OPERATED SECTIONALIZING
SWITCH (NORMALLY CLOSED)



SINGLE-POLE MOTOR OPERATED SECTIONALIZING
SWITCH (NORMALLY OPEN)



SINGLE-POLE MANUAL SECTIONALIZING
SWITCH (NORMALLY OPEN)



SINGLE-POLE MANUAL SECTIONALIZING
SWITCH (NORMALLY CLOSED)



SINGLE-POLE MOTOR
OPERATED SECTIONALIZING
SWITCH WITH GROUND



SINGLE-POLE MANUAL SECTIONALIZING
SWITCH WITH GROUND



GANGED GROUNDING DISCONNECT SWITCHES



ELECTRICAL CONNECTION



SECTION INSULATOR



JUMPED SECTION INSULATOR



SECTION INSULATOR WITH BY-PASS SWITCH



PHASE BREAK



PHASE BREAK

LOW VOLTAGE CIRCUIT BREAKER



FUSE



FUSED DISCONNECT SWITCH



TRANSFORMER



AUTOTRANSFORMER



VOLTAGE TRANSFORMER (VT)



COUPLING CAPACITOR
VOLTAGE TRANSFORMER



MANHOLE OR HANDHOLE



CAPACITOR



CURRENT TRANSFORMER (CT)



GROUND CONNECTION



SURGE ARRESTER



CABLE TERMINATION
OR STRESS CONE



DOUBLE-POLE MOTORIZED
DISCONNECT SWITCH



OCS SECTION GAP



KEY-INTERLOCK



DIRECTION OF CONTROL OR
RELAY INFLUENCE LINE



MANUALLY OPERATED
GROUNDING SWITCH



NO LOAD BREAK MANUALLY
OPERATED DISCONNECT SWITCH



HV 3 PHASE DISCONNECT SWITCH



SINGLE-POLE HIGH VOLTAGE
POWER CIRCUIT BREAKER



DOUBLE-POLE HIGH VOLTAGE
POWER CIRCUIT BREAKER



DRAW-OUT FUSED (VT)



DRAW-OUT TYPE MEDIUM VOLTAGE
SINGLE-POLE CIRCUIT BREAKER



DRAW-OUT TYPE MEDIUM VOLTAGE
DOUBLE-POLE CIRCUIT BREAKER



INSULATOR



BREAK LINE



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY S. MILITELLO
DRAWN BY T. DOUNG
CHECKED BY J. CHIRCO
IN CHARGE K. JONG
DATE 07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
GENERAL DIRECTIVE

SYMBOLS 2

CONTRACT NO. 13259
DRAWING NO. DD-GE-111
SCALE NO SCALE
SHEET NO.

California High-Speed Train Project

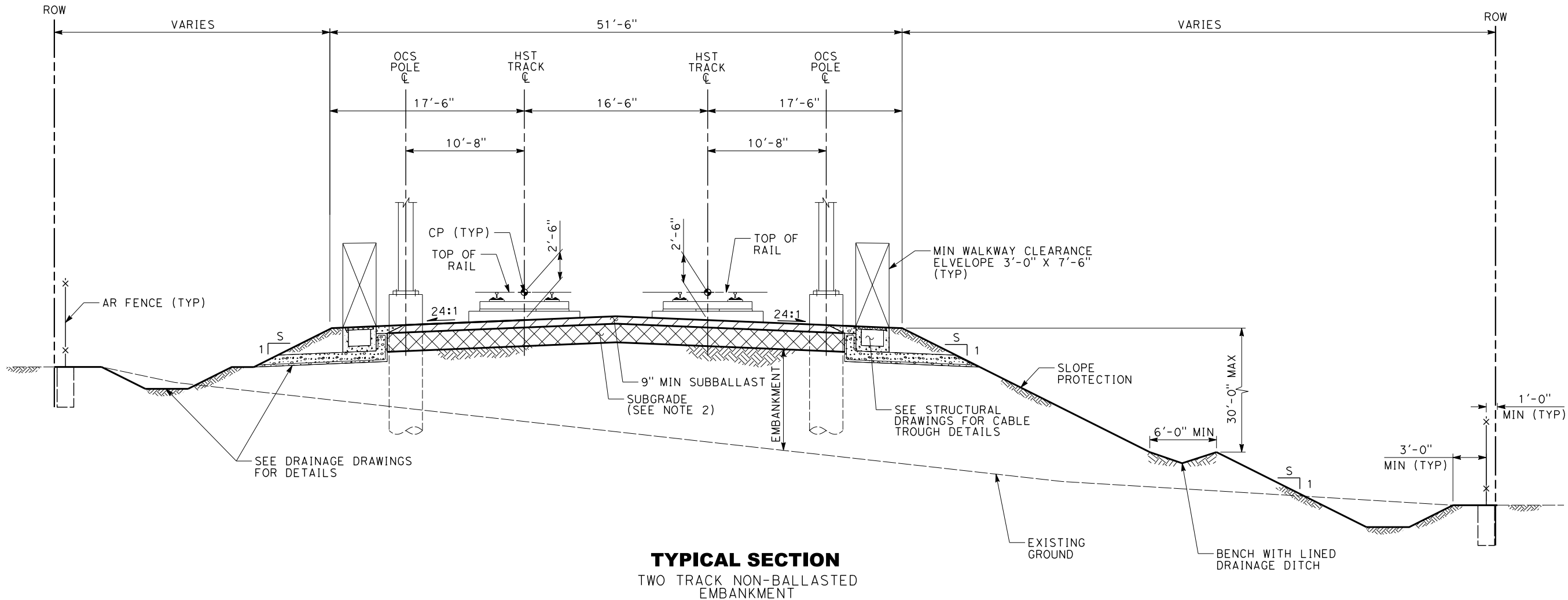


Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Civil

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HuanTe



- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
 3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.

TYPICAL SECTION
TWO TRACK NON-BALLASTED
EMBANKMENT



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

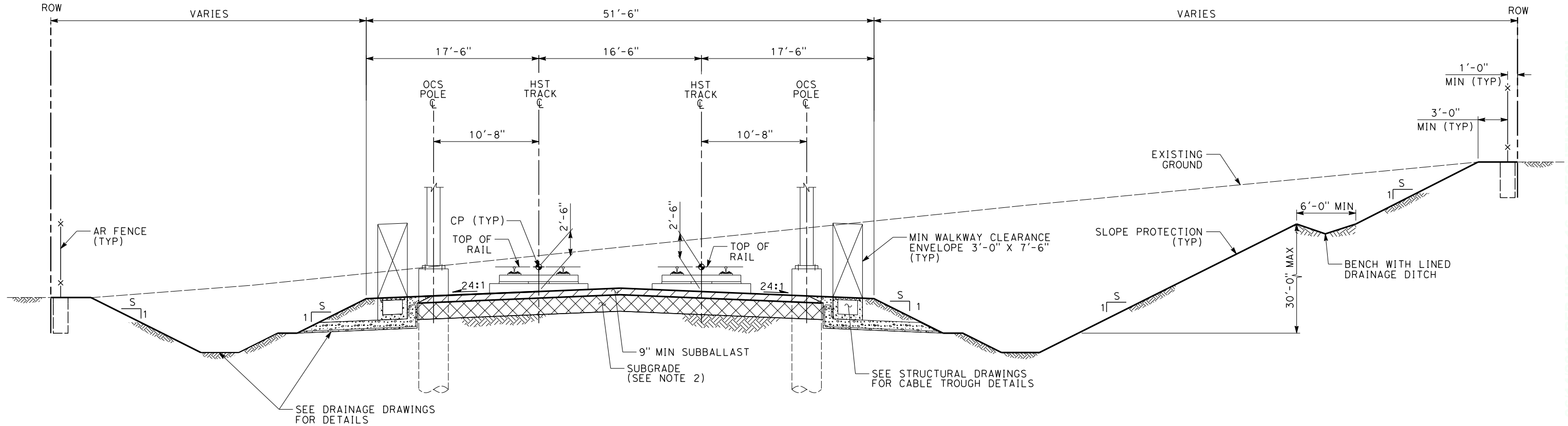
DESIGNED BY D. MANITI
DRAWN BY V. HUANTE
CHECKED BY G. HARRIS
IN CHARGE J. CHIRCO
DATE 07/12/2013



CALIFORNIA HIGH-SPEED TRAIN PROJECT CIVIL DIRECTIVE		CONTRACT NO.
TYPICAL CROSS SECTION TWO TRACK NON-BALLASTED EMBANKMENT		DRAWING NO. DD-CV-001
		SCALE AS SHOWN
		SHEET NO.

05/14/2013
HSR 13-06 - EXECUTION VERSION

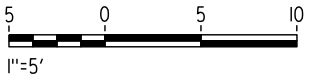
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HuanTe



TYPICAL SECTION
TWO TRACK NON-BALLASTED
OPEN CUT

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY D. MANITI
DRAWN BY V. HUANTE
CHECKED BY G. HARRIS
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

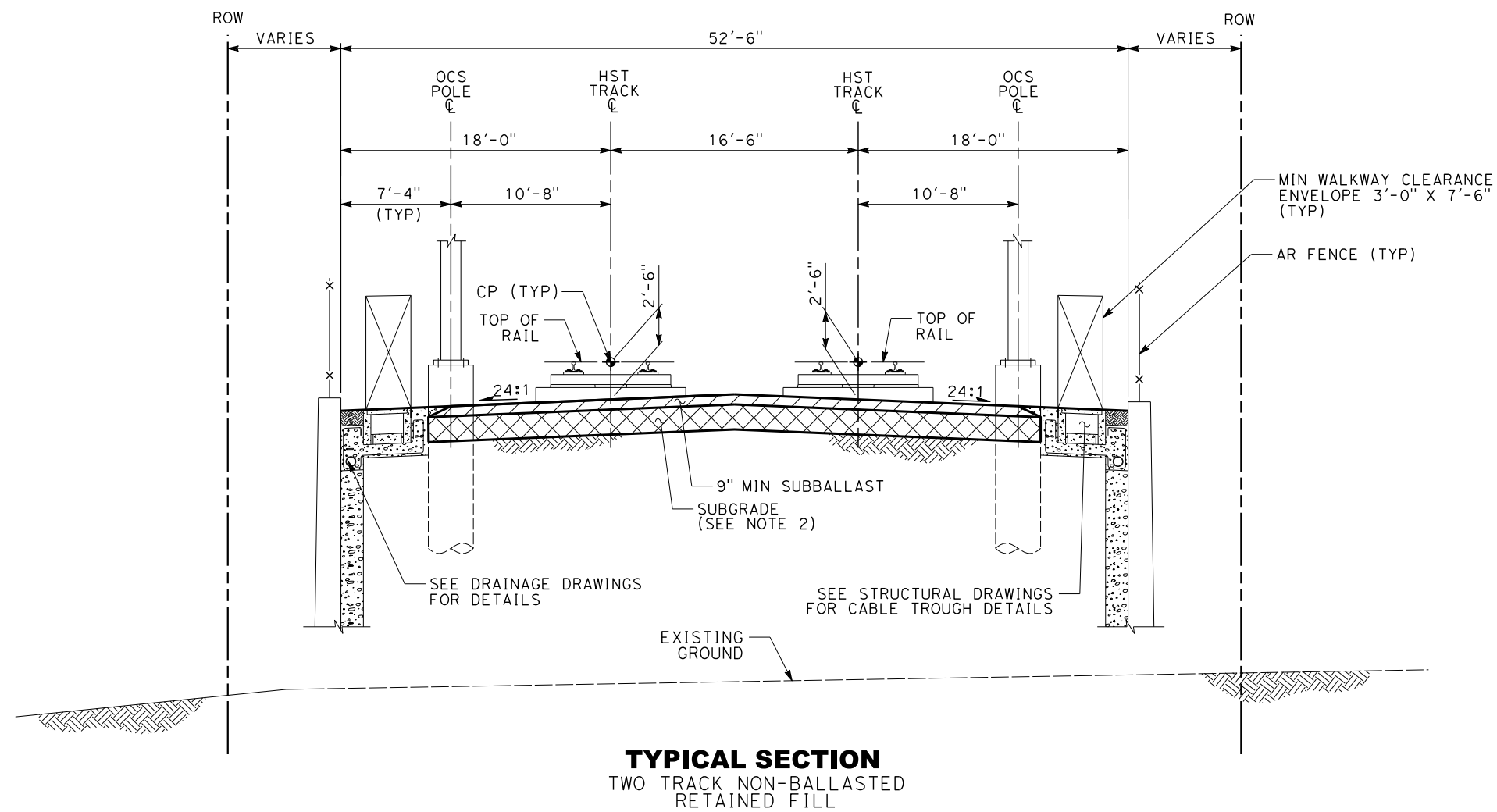
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE**

TYPICAL CROSS SECTION
TWO TRACK NON-BALLASTED
OPEN CUT

CONTRACT NO.
DRAWING NO. DD-CV-002
SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

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HuanTe



NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY D. MANITI
DRAWN BY V. HUANTE
CHECKED BY G. HARRIS
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**

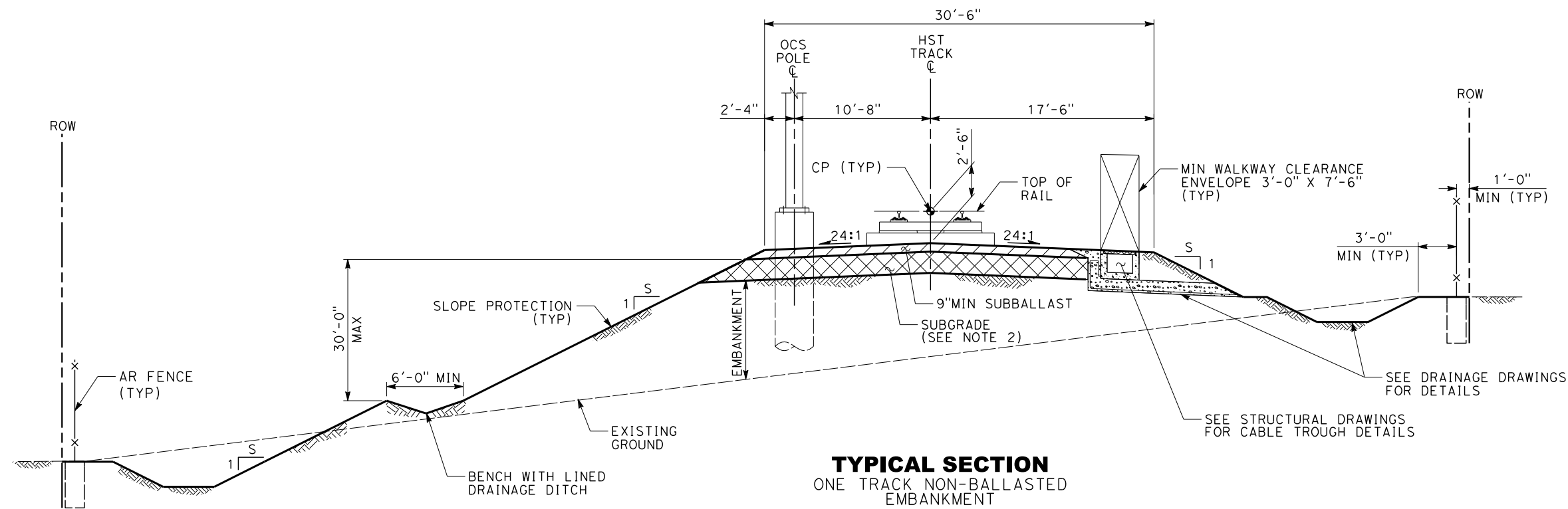


CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

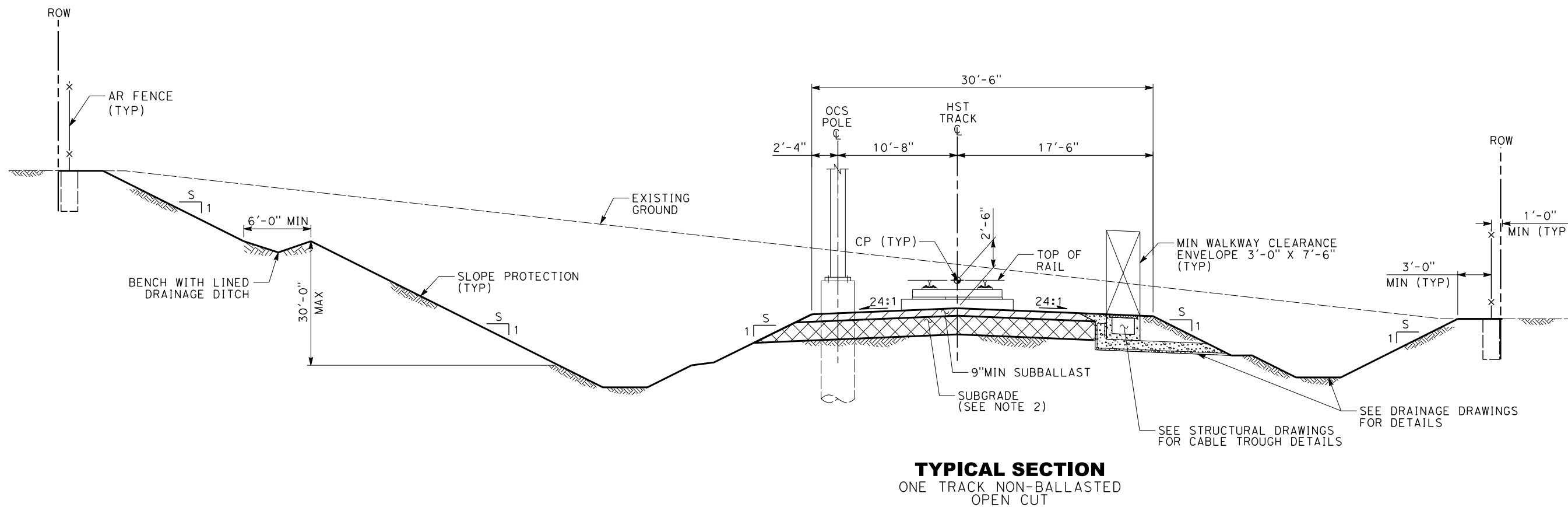
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE**

TYPICAL CROSS SECTION
TWO TRACK NON-BALLASTED
RETAINED FILL

CONTRACT NO.
DRAWING NO. DD-CV-003
SCALE AS SHOWN
SHEET NO.



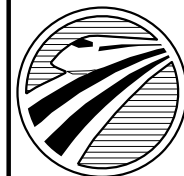
- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. SUBGRADE THICKNESS SHALL BE DETERMINED BASED ON THE EXISTING GROUND CONDITION.
 3. THE CONTROL POINT (CP) SHALL BE 2'-6" ABOVE THE TOP OF SUBBALLAST.



A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	D. MANITI
DRAWN BY	V. HUANTE
CHECKED BY	G. HARRIS
IN CHARGE	J. CHIRCO
DATE	07/12/2013

**PARSONS
BRINCKERHOFF**



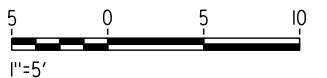
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY


CALIFORNIA HIGH-SPEED TRAIN PROJECT CIVIL DIRECTIVE

TYPICAL CROSS SECTION
ONE TRACK NON-BALLASTED
EMBANKMENT AND OPEN CUT

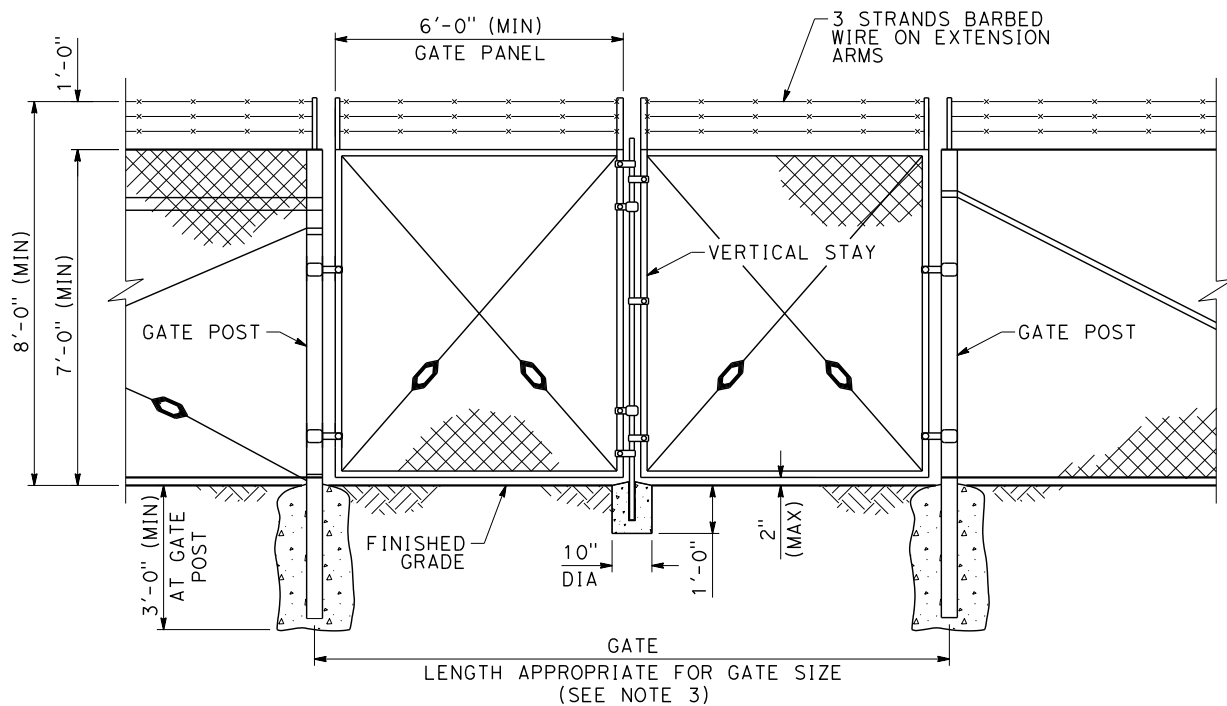
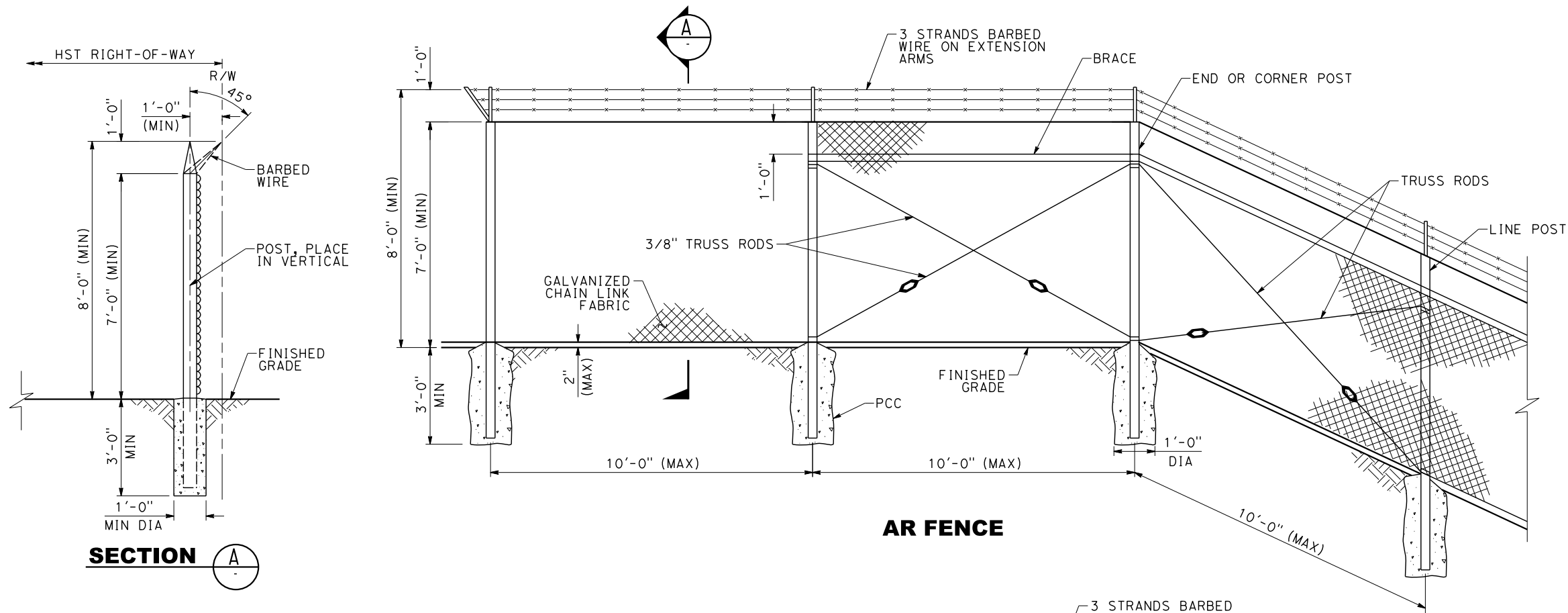
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DRAWING NO.	DD-CV-004
SCALE	AS SHOWN
SHEET NO.	

- HSR 13-06 - EXECUTION VERSION**

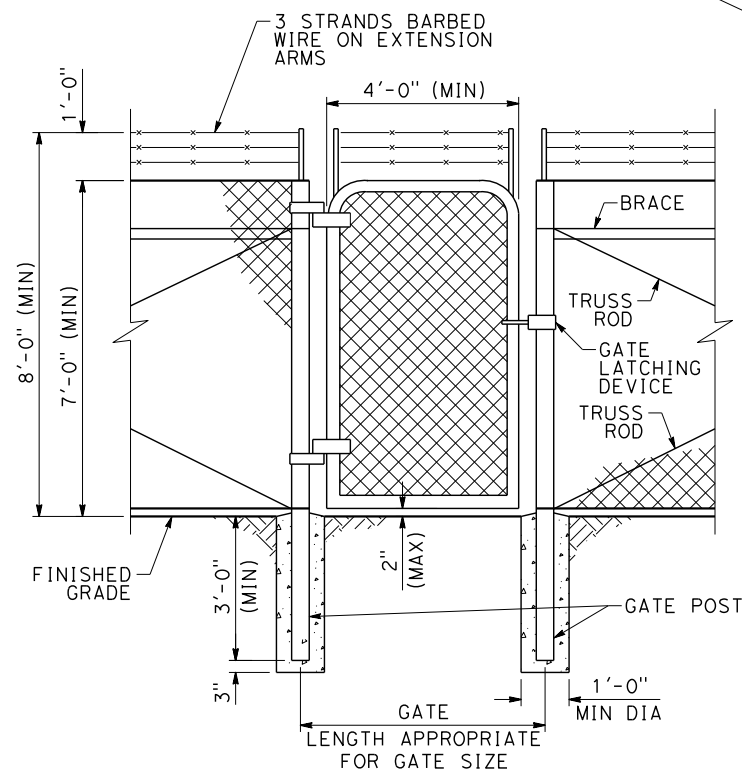


						DESIGNED BY D. MANITI	<div><div>PARSONS BRINCKERHOFF</div><div><div>CALIFORNIA HIGH-SPEED RAIL AUTHORITY</div></div></div>	<div><div>CALIFORNIA HIGH-SPEED TRAIN PROJECT CIVIL DIRECTIVE</div><div>TYPICAL CROSS SECTION FOUR TRACK NON-BALLASTED EMBANKMENT</div></div>	CONTRACT NO.
						DRAWN BY V. HUANTE			DRAWING NO. DD-CV-005
						CHECKED BY G. HARRIS			SCALE AS SHOWN
A	05/31/13					IN CHARGE J. CHIRCO			
						DATE 07/12/2013			SHEET NO.
REV	DATE	BY	CHK	APP	DESCRIPTION				

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VEHICLE ACCESS GATE ALONG AR FENCE



PEDESTRIAN ACCESS GATE ALONG AR FENCE

NOTES:

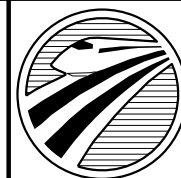
1. ALL PERMANENT FENCING AND GATES SHALL BE BONDED, GROUNDED AND INSULATED TO PREVENT ELECTRIC SHOCK
2. ACCESS RESTRICTIONS (AR) FENCING SHALL BE 8 FEET HIGH MINIMUM (AS SHOWN HERE). ACCESS DETERRING (AD) FENCING (NOT SHOWN) SHALL BE 6 FEET HIGH, WITH NO BARBED WIRE
3. GATES FOR VEHICULAR ACCESS (DRIVING GATES) SHALL BE SIZED IN COORDINATION WITH EMERGENCY RESPONDERS AND MAINTENANCE EQUIPMENT. IF NO OTHER INFORMATION IS AVAILABLE THESE GATES SHOULD HAVE A MINIMUM WIDTH OF TWELVE (12) FEET.
4. GATES CAN EITHER BE SWINGING OR SLIDING TYPE. VEHICULAR ACCESS SWINGING GATES SHALL BE A PAIR AND SHALL BE HINGED FROM THE INSIDE. PROVISIONS SHALL BE MADE FOR SWINGING GATES TO SWING NOT LESS THAN 90 DEGREES AWAY FROM THE HST FACILITIES.
5. THIS DRAWING DEPICTS MINIMUM STANDARDS FOR RIGHT-OF-WAY FENCING AND GATE. ALTERNATIVE FENCE TYPE OF EQUIVALENT OR ENHANCED KIND MAY BE ALLOWED UPON APPROVAL OF THE AUTHORITY.



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY M. ACOSTA
DRAWN BY V. HUANTE
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE

FENCE AND GATE DETAILS

CONTRACT NO.
DRAWING NO. DD-CV-006
SCALE AS SHOWN
SHEET NO.



1. LOCATION OF GATES ALONG RIGHT-OF-WAY FENCING MAY REQUIRE COORDINATION WITH THE LOCAL FIRE PROTECTION AGENCY AND EMERGENCY RESPONDERS.
2. IN GENERAL VEHICULAR ACCESS GATE ALONG AT-GRADE TRACKWAY, SHALL BE LOCATED NOMINALLY AT 2.5 MILE INTERVALS AND COORDINATED WITH THE LOCATION OF HST WAYSIDE FACILITIES.
3. GATE LOCATIONS ALONG FENCING WITHIN FREEWAY RIGHT-OF-WAY REQUIRE CALTRANS APPROVAL.
4. VEHICULAR ACCESS GATES SHALL BE PROVIDED IN CONJUNCTION WITH EITHER ACCESS ROADS OR AT LOCATIONS WHERE EXISTING ROADS MAKE IT PRACTICABLE FOR MAINTENANCE AND EMERGENCY VEHICLE TO ACCESS THE TRACKWAY.
5. FOR ADDITIONAL DETAILS SEE CIVIL DRAWING "FENCE AND GATE DETAILS".



1

IN CHARGE	J. CHIRCO
DATE	07/12/2013

Discussion



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

FENCE AND GATE LOCATIONS

NO SCALE

SHEET NO.



1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR SOLID PLATE REQUIREMENT, SEE OVERHEAD CONTACT SYSTEM AND TRACTION POWER RETURN SYSTEM CHAPTER OF THE DESIGN CRITERIA.
3. EXTEND SOLID PLATE 30 FEET FROM CENTERLINE OF OUTERMOST TRACK.



DESIGNED BY	M. ACOSTA
DRAWN BY	V. HUANTE
CHECKED BY	S. MILITELLO
IN CHARGE	J. CHIRCO
DATE	07/12/2013

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

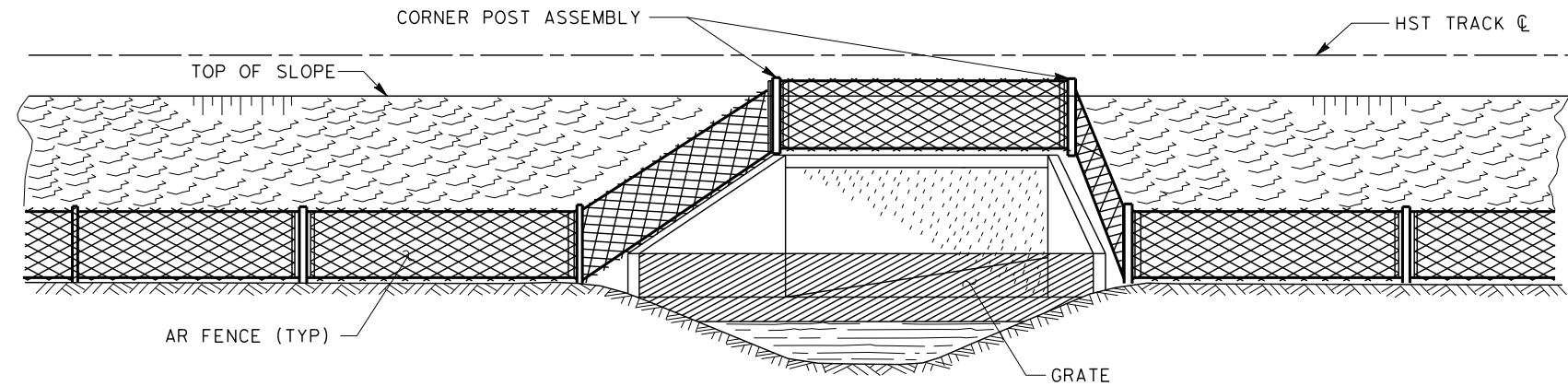
FENCING ON GRADE SEPARATED STRUCTURES

SHEET NO.

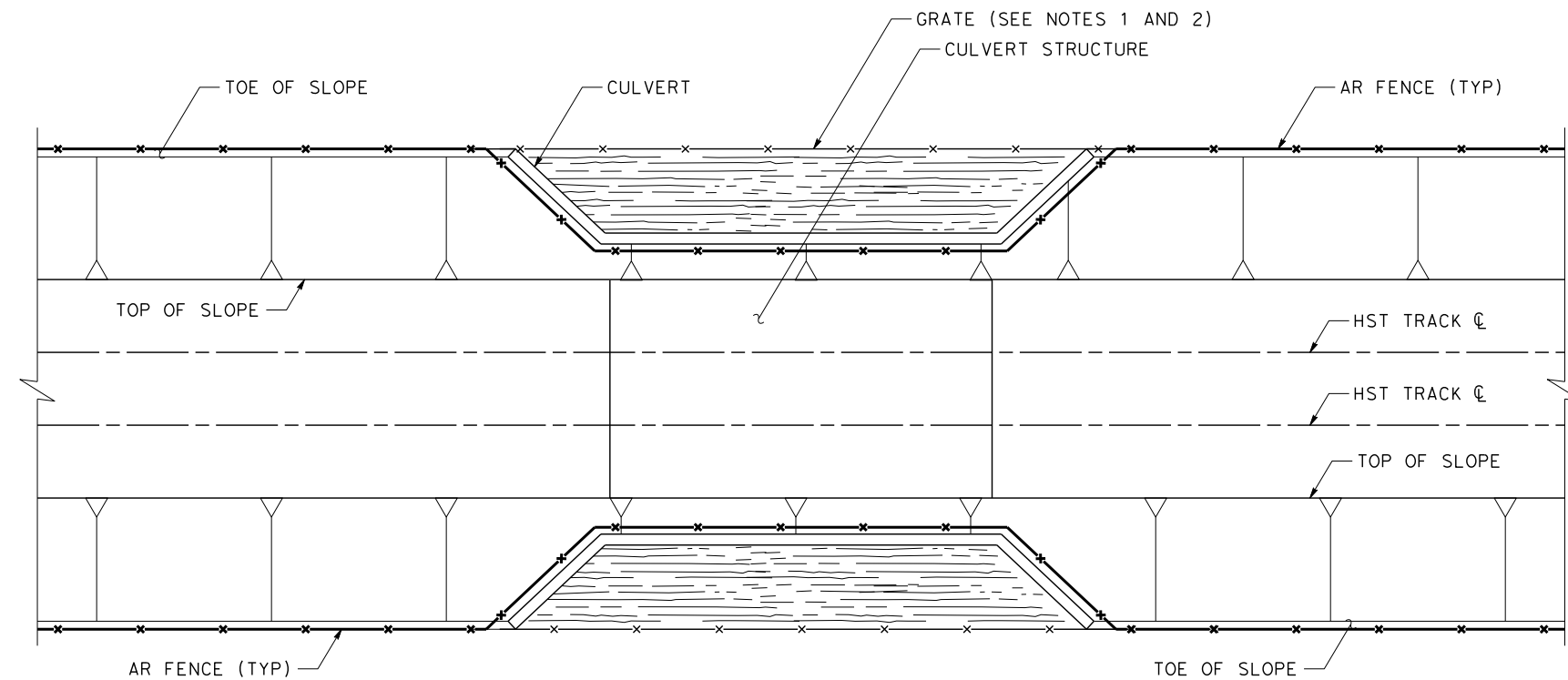
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Huante



ELEVATION



PLAN

NOTES:

1. GRATES SHALL BE INSTALLED UPSTREAM AND DOWNSTREAM OF CULVERT HEADWALLS.
2. GRATES SHALL HAVE BARS SPACED 6 INCHES APART AND SHALL BE DESIGNED TO WITHSTAND MAXIMUM IMPACT FROM LARGEST EXPECTED FLOATING DEBRIS.
3. THE MAXIMUM DISTANCE FROM THE BOTTOM OF THE GRATE TO THE BOTTOM AND SIDE SLOPES OF THE WATER WAY CROSSING SHALL BE 6 INCHES.
4. THE MINIMUM HEIGHT OF THE GRATES SHALL BE SUCH THAT IT RESTRICTS ACCESS DURING ALL CONDITIONS (DRY, HIGH WATER, ETC).
5. GRATE INSTALLATIONS SHALL BE COORDINATED WITH THE HYDRAULIC ENGINEER TO ENSURE PRESERVATION OF THE CULVERT FLOW CAPACITY.

A	05/31/13				EXECUTION VERSION
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DESIGNED BY	M. ACOSTA
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IN CHARGE	J. CHIRCO
DATE	07/12/2013

**PARSONS
BRINCKERHOFF**



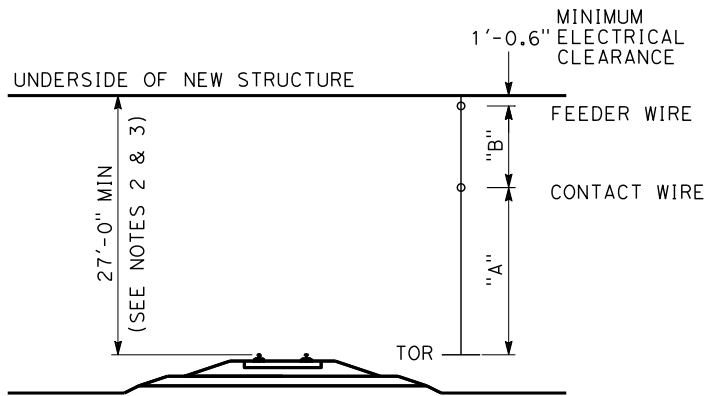
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE**

FENCE AT CULVERT CROSSINGS

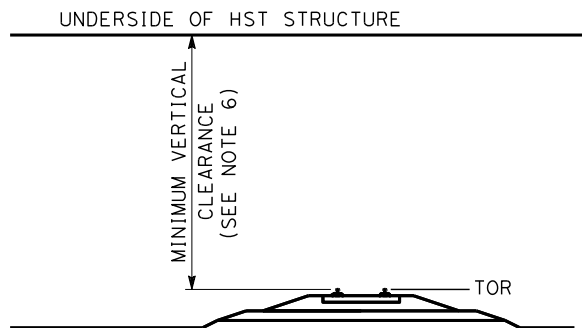
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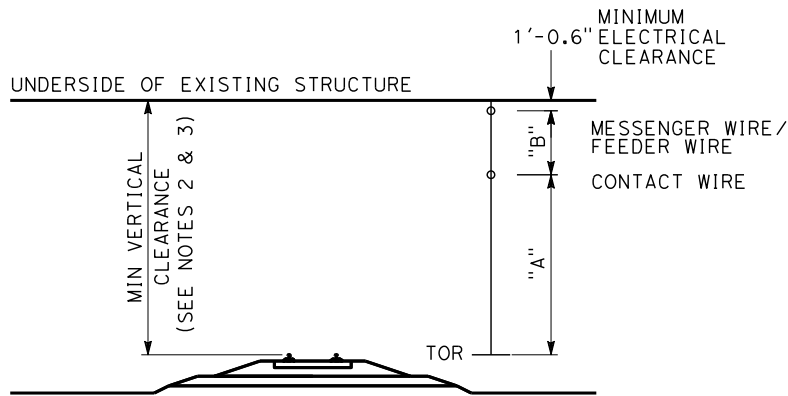
NEW STRUCTURE OVER HST TRACKS

	HEIGHT "A"	HEIGHT "B"	MIN VERTICAL CLEARANCE
DEDICATED HST TRACK	17'-5"	8'-3.5"	27'-0"
SHARED USE TRACK	18'-9"	7'-0.5"	27'-0"



NEW HST STRUCTURE OVER TRACK

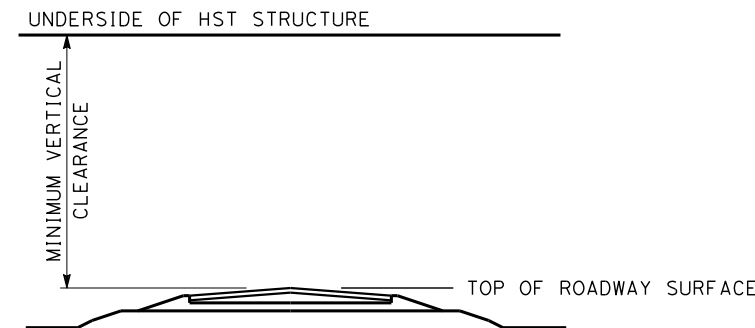
	MIN VERTICAL CLEARANCE
<u>FREIGHT TRACKS</u>	
BNSF	23'-4"
UPRR	23'-0"
<u>NON-FREIGHT TRACKS</u>	
METROLINK	24'-0"
CALTRAIN	24'-6"



EXISTING STRUCTURE OVER HST TRACKS

	HEIGHT "A"	HEIGHT "B"	MIN VERTICAL CLEARANCE
DEDICATED HST TRACK	17'-5"	8'-3.5"	27'-0"
DEDICATED HST TRACK (V ≤ 125 MPH)	17'-5"	5'-3"	24'-0"*
SHARED USE TRACK	18'-9"	4'-0"	24'-6"*

* SEE NOTE 2



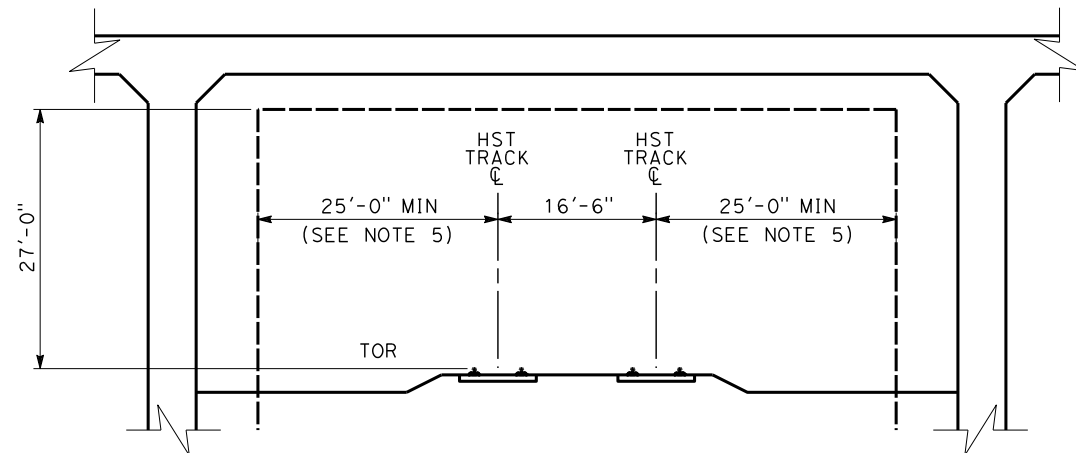
NEW HST STRUCTURE OVER ROADWAY

	MIN VERTICAL CLEARANCE
FREEWAY/EXPRESSWAY	16'-6"
LOCAL ROADWAY	15'-0" *
EXTRA LEGAL LOAD NETWORK(ELLN)	20'-3"

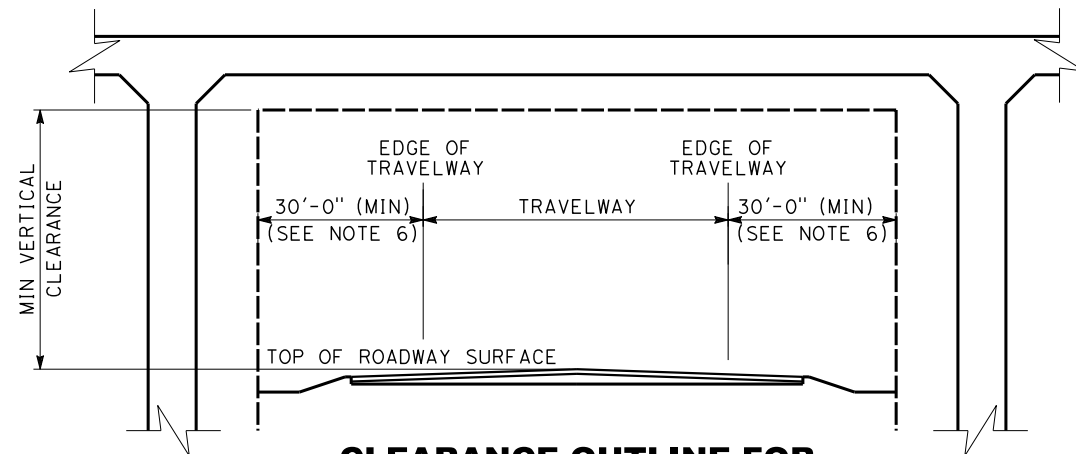
* SEE NOTE 4

NOTES:

1. TOLERANCES ARE NOT ADDITIVE FOR INCREMENTAL DISTANCES.
2. DEFINED CLEARANCES ASSUMES GRADE SEPARATED STRUCTURE LENGTH ALONG TRACK IS NO MORE THAN 160 FEET FOR HST TRACK OVER 125 MPH. THE OCS SHALL BE FREE RUNNING UNDER GRADE SEPARATED STRUCTURES WITH NO SUPPORTS. STRUCTURES WIDER THAN 160' REQUIRE FURTHER ENGINEER APPROVAL.
3. AT LOCATIONS WHERE SUPERELEVATION IS PRESENT, VERTICAL CLEARANCES SHALL BE MEASURED FROM THE HIGH RAIL.
4. AT LOCAL ROADWAYS, 15 FEET MINIMUM VERTICAL CLEARANCE SHOULD BE DISCUSSED WITH LOCAL AGENCY FOR CONCURRENCE.
5. PROTECTIVE STRUCTURE IS REQUIRED IF SIDE CLEARANCE IS LESS THAN 25 FEET.
6. RIGID TRAFFIC BARRIER MAY BE REQUIRED IF SIDE CLEARANCE IS LESS THAN 30 FEET.
7. SEE APPLICABLE LOCAL DESIGN CRITERIA FOR SIDE CLEARANCE.



CLEARANCE OUTLINE FOR NEW STRUCTURE OVER HST



CLEARANCE OUTLINE FOR NEW HST STRUCTURE OVER ROADWAY

	MIN SIDE CLEARANCE
FREEWAY/EXPRESSWAY	30'-0"
OTHER	SEE NOTE 7

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY S. MILITELLO
DRAWN BY V. HUANTE
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT CIVIL DIRECTIVE

MINIMUM CLEARANCE
GRADE SEPARATED STRUCTURES

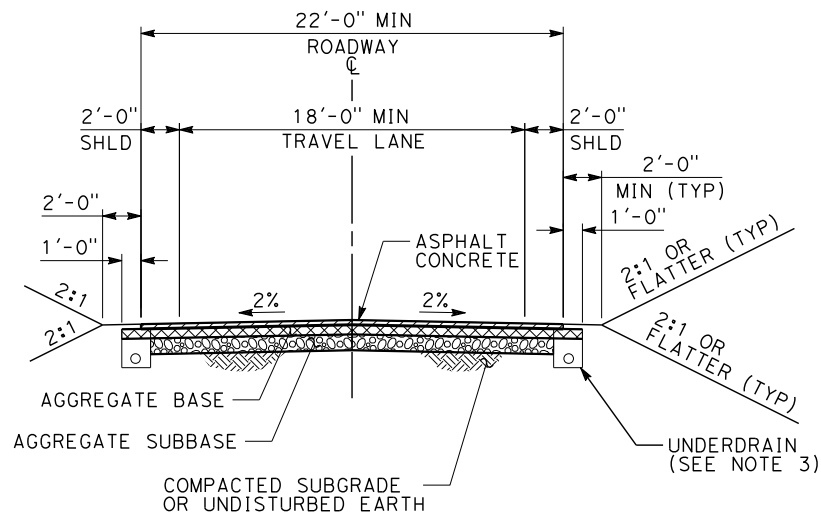
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DRAWING NO. DD-CV-010
SCALE NO SCALE
SHEET NO.

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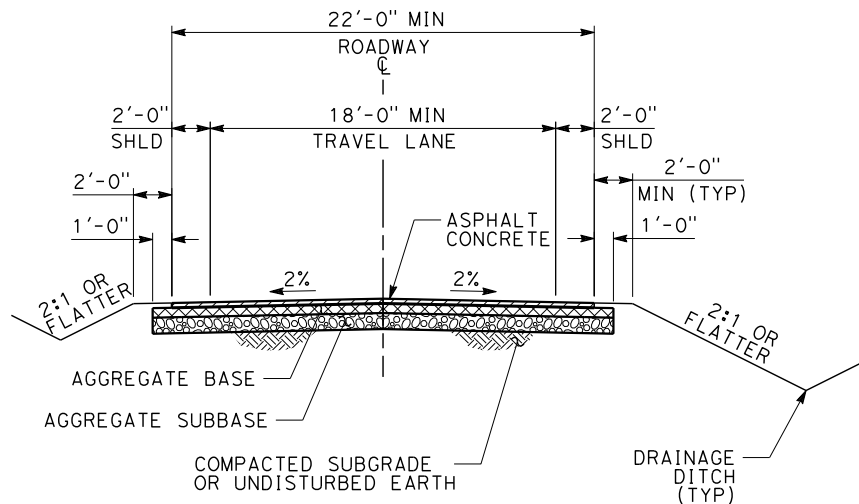
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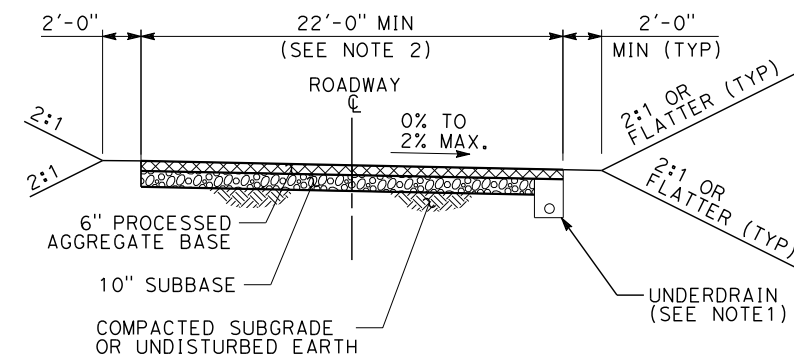
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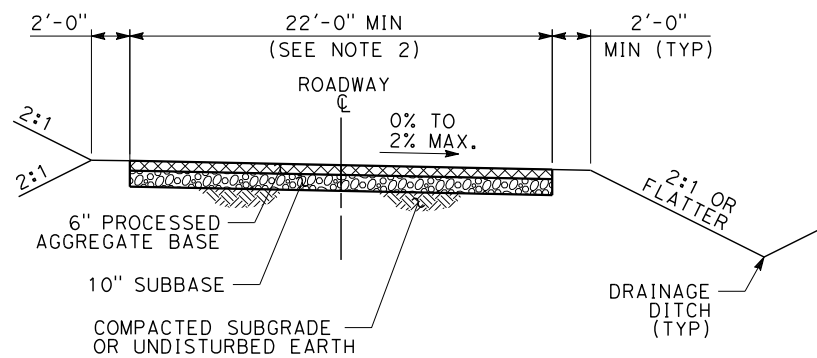
**TYPICAL 22 FT ROADWAY
SECTION-PAVED
CLOSED DRAINAGE**



**TYPICAL 22 FT ROADWAY
SECTION-PAVED
OPEN DRAINAGE**



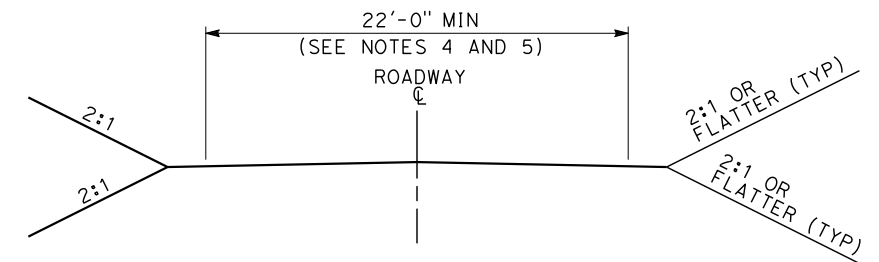
**TYPICAL 22 FT ROADWAY
SECTION-UNPAVED
CLOSED DRAINAGE**



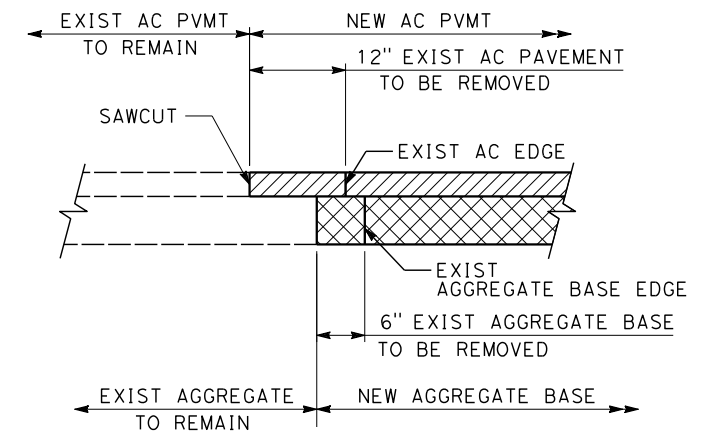
**TYPICAL 22 FT ROADWAY
SECTION-UNPAVED
OPEN DRAINAGE**

NOTES:

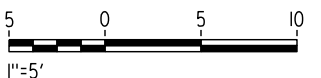
1. AUTHORITY ROADWAYS ARE REFERRED TO AS ACCESS ROADS AND SERVICE ROADS.
2. UNPAVED ROADWAYS CAN BE USED AS TEMPORARY ACCESS TO SITES.
3. REFER TO CALTRANS STANDARD PLANS FOR:
A) CURBS AND DRIVEWAYS (A87A)
B) UNDERDRAINS (D102)
4. IF FIRE HYDRANT IS LOCATED ON ROAD, MINIMUM ROADWAY WIDTH SHALL BE 26 FEET.
5. TWO-WAY SERVICE ROADS SHALL BE 24 FEET WIDE WITH NO SHOULDERS.
6. COMPACT SUBGRADE TO 95% COMPACTION.



AUTHORITY ROADWAYS WIDTH



PAVEMENT CONNECTION DETAIL
SCALE: 1"=1'-0"



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY S. MILITELLO
DRAWN BY V. HUANTE
CHECKED BY A. ABTAHI
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
CIVIL DIRECTIVE**

AUTHORITY ROADWAYS

CONTRACT NO.
DRAWING NO. DD-CV-011
SCALE AS SHOWN
SHEET NO.

HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project

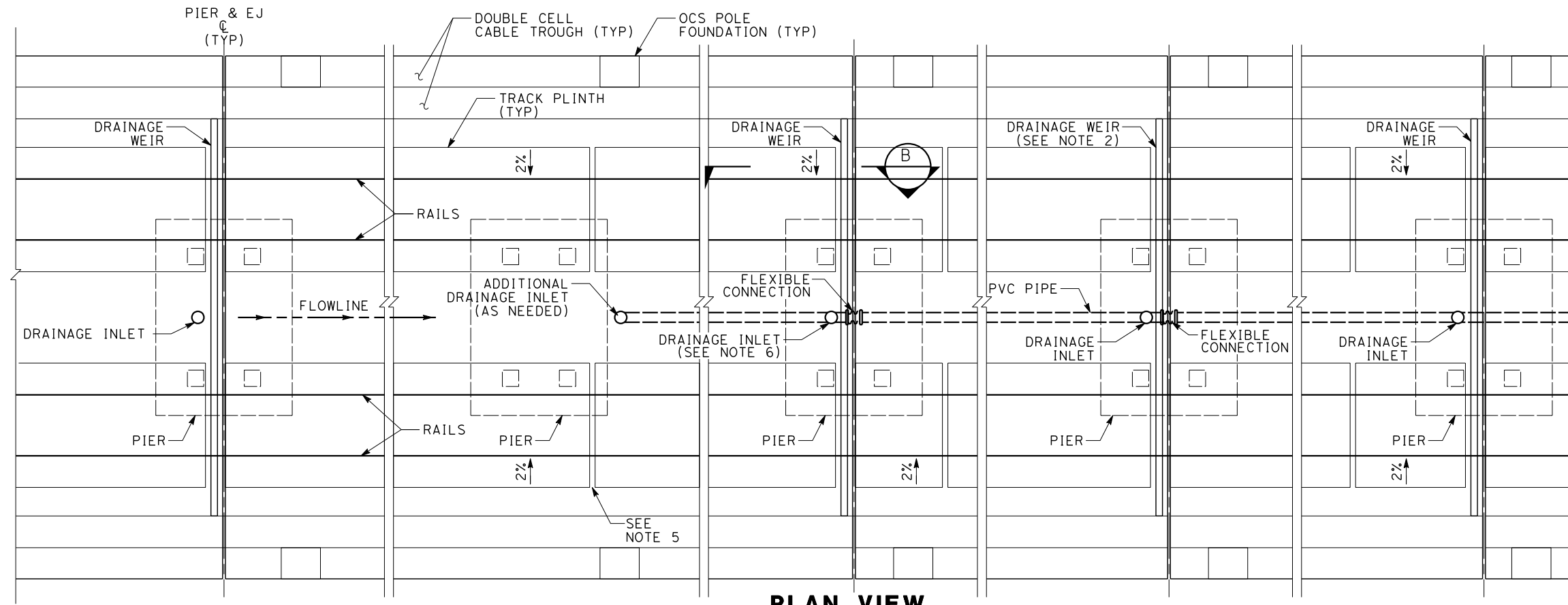


Request for Proposal for Design-Build Services

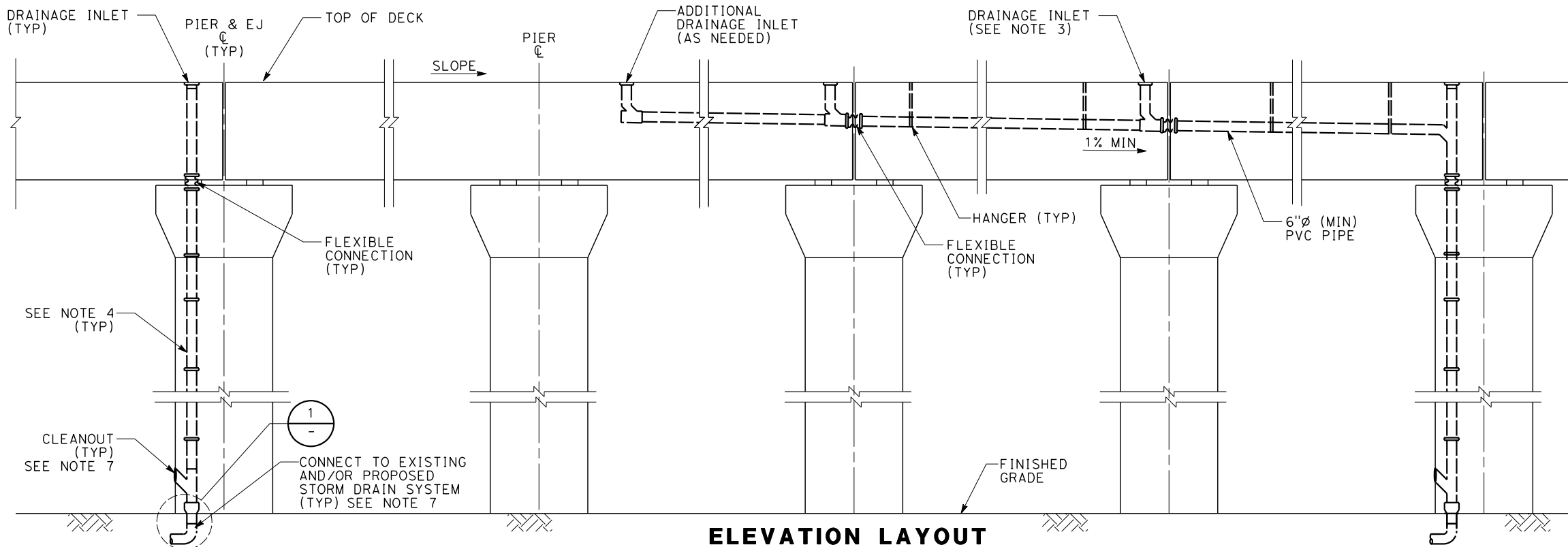
RFP No.: HSR 11-16
Directive Drawings

Drainage

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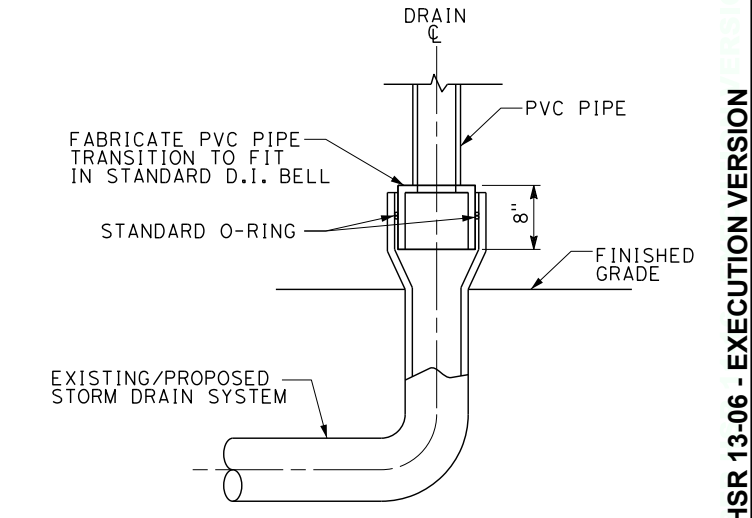
PLAN VIEW



ELEVATION LAYOUT

NOTES:

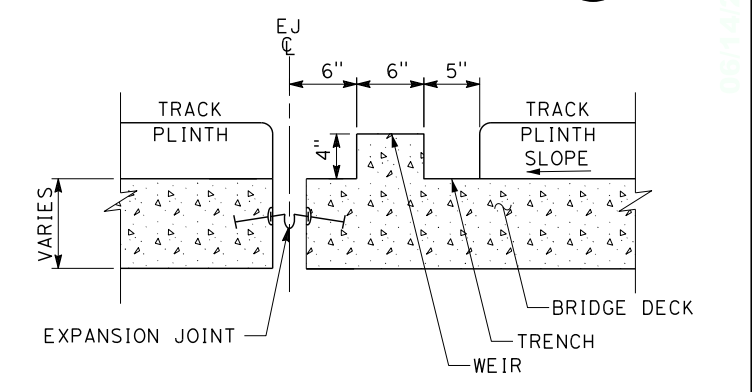
1. TRACK, SYSTEMS AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. WEIR AND INLET SHALL BE PROVIDED UPSTREAM OF EVERY EXPANSION JOINT, SEE "NON-BALLASTED AERIAL STRUCTURE DECK DRAINAGE SYSTEM" FOR EXPANSION JOINT DETAILS.
3. IF DOWNSPOUT IS NOT FEASIBLE AT EXPANSION JOINT, COLUMN CONNECTED STORM WATER MAY BE CONVEYED THROUGH PVC PIPE, USING FLEXIBLE CONNECTIONS AT EXPANSION JOINTS, UNTIL DOWNSPOUT CAN BE CONNECTED TO EXISTING/ PROPOSED STORM DRAIN SYSTEM.
4. PROVIDE MINIMUM 1-6" GAP BETWEEN PVC PIPE AND INTERIOR COLUMN WALL.
5. PROVIDE A 5-INCH WIDE GAP IN TRACK PLINTH, 20 FEET ON CENTER AND ONE JUST UPSTREAM OF THE WEIR, SEE DETAIL.
6. REFER TO DRAINAGE DRAWING "AERIAL STRUCTURE BRIDGE DECK DRAINAGE INLET DETAIL" FOR DRAINAGE INLET DETAIL.
7. CLEANOUTS AND PIPE PENETRATIONS FROM THE COLUMNS SHALL BE OUTSIDE OF THE PLASTIC HINGE



TRANSITION DETAIL

NO SCALE

1



SECTION

NO SCALE

B

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY K. SISTLA
DRAWN BY V. HUANTE
CHECKED BY A. ABTAHI
IN CHARGE J. CHIRCO
DATE 07/12/2013

PARSONS
BRINCKERHOFF



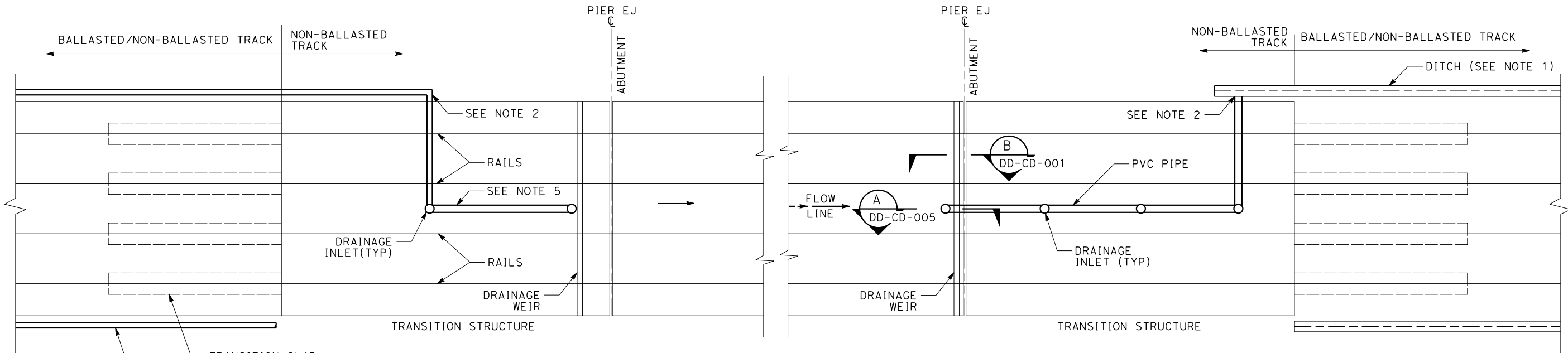
CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE

NON-BALLASTED AERIAL STRUCTURE
DECK DRAINAGE SYSTEM

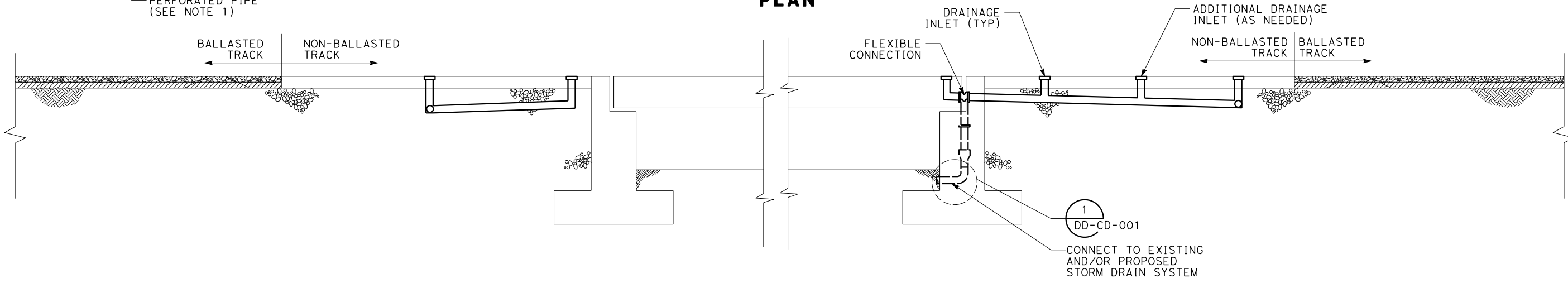
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DRAWING NO. DD-CD-001
SCALE NO SCALE
SHEET NO.

HSR 13-06 - EXECUTION VERSION

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PLAN



ELEVATION

- NOTES:**
1. TRACK AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. PERFORATED UNDERDRAIN DRAINAGE SYSTEM OR TRACKSIDE DITCHES. SEE "TRACK DRAIN/UNDERDRAIN CLEANOUT AND RISER DETAILS" AND "DITCH DETAILS" FOR DRAINAGE SYSTEM DETAILS.
 3. STORM DRAIN SYSTEM CONNECTS TO AN UNDERGROUND SYSTEM OR TRACKSIDE DITCHES.
 4. INLET AND WIER REQUIRED UPSTREAM OF ALL EXPANSION JOINTS. FOR MULTIPLE SPAN BRIDGES WITH INTERMEDIATE EXPANSION JOINTS, SEE "NON-BALLASTED AERIAL STRUCTURE DECK DRAINAGE SYSTEM".
 5. STORM DRAIN INLET MAY DISCHARGE TO OVERSIDE DRAIN ON THE EMBANKMENT.

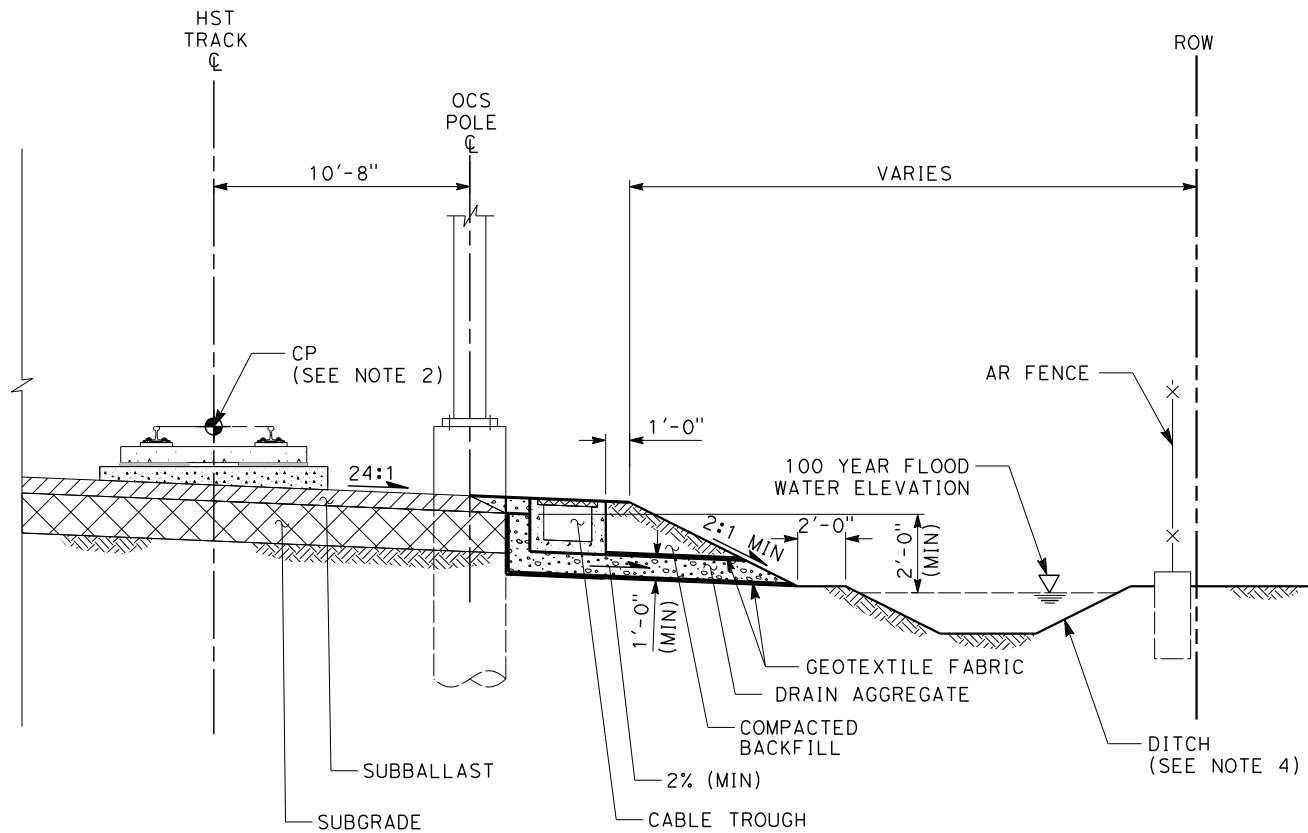
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							CHECKED BY A. ABTAHI				SCALE NO SCALE
							IN CHARGE J. CHIRCO				SHEET NO.
							DATE 07/12/2013				
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05/14/2013
HSR 13-06 - EXECUTION VERSION

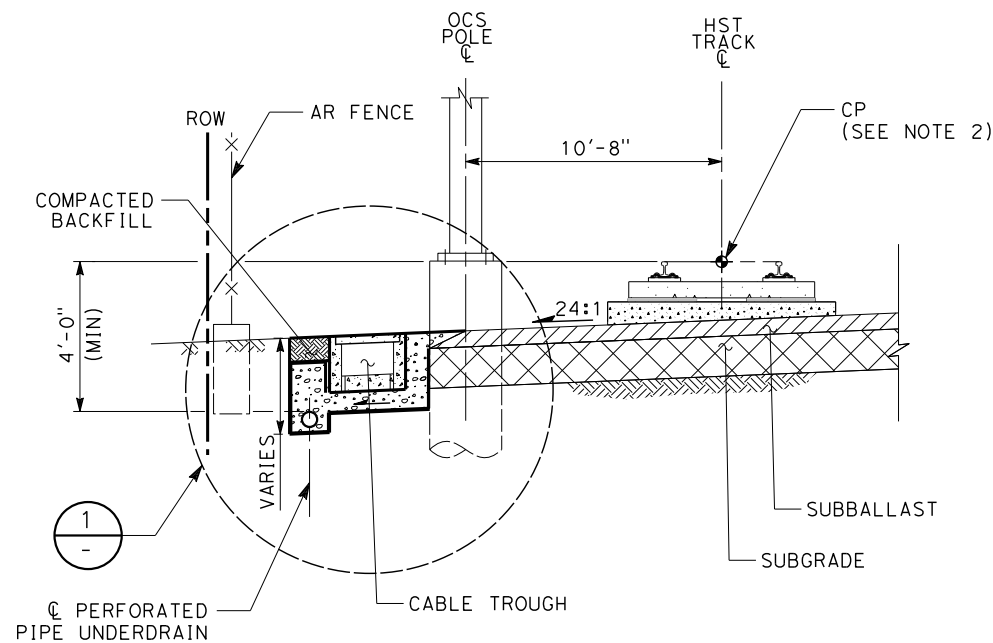
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Huante



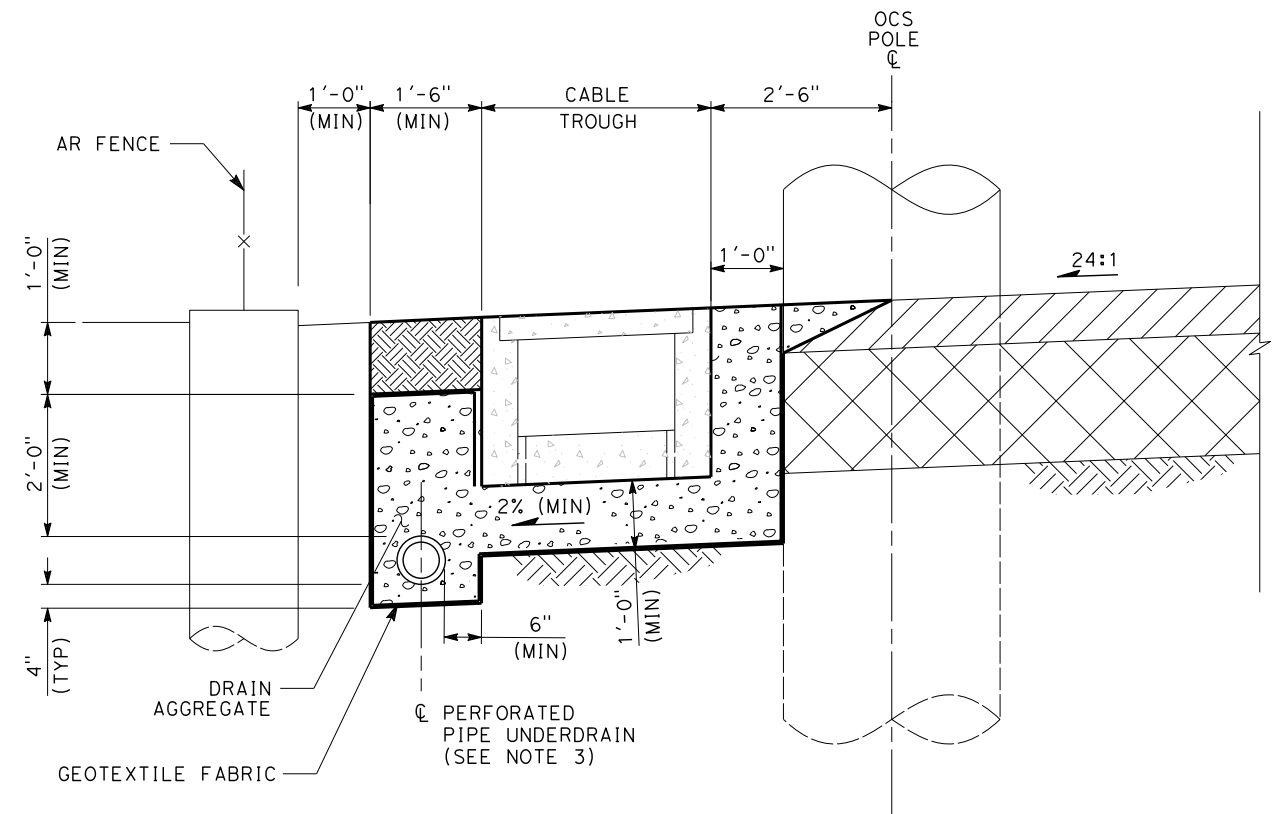
TYPICAL SECTION
AT GRADE TRACK OPEN DRAINAGE SYSTEM



TYPICAL SECTION
AT GRADE TRACK CLOSED DRAINAGE SYSTEM

NOTES:

1. TRACK AND SYSTEMS ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE CONTROL POINT (CP) IS THE INTERSECTION OF THE CENTERLINE OF TRACK AND THE TOP OF THE RAIL, FOR SUPERELEVATED TRACK SECTIONS THE CP IS THE INTERSECTION OF THE CENTERLINE OF THE TRACK AND THE TOP OF THE LOW RAIL.
3. TRACK DRAINAGE SYSTEM SHALL BE CONNECTED AND DISCHARGE TO THE LOCAL STORM DRAIN SYSTEM.
4. REFER TO DRAINAGE DRAWING "DITCH DETAILS".



DETAIL
NO SCALE

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY K. SISTLA
DRAWN BY V. HUANTE
CHECKED BY A. ABTAHI
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

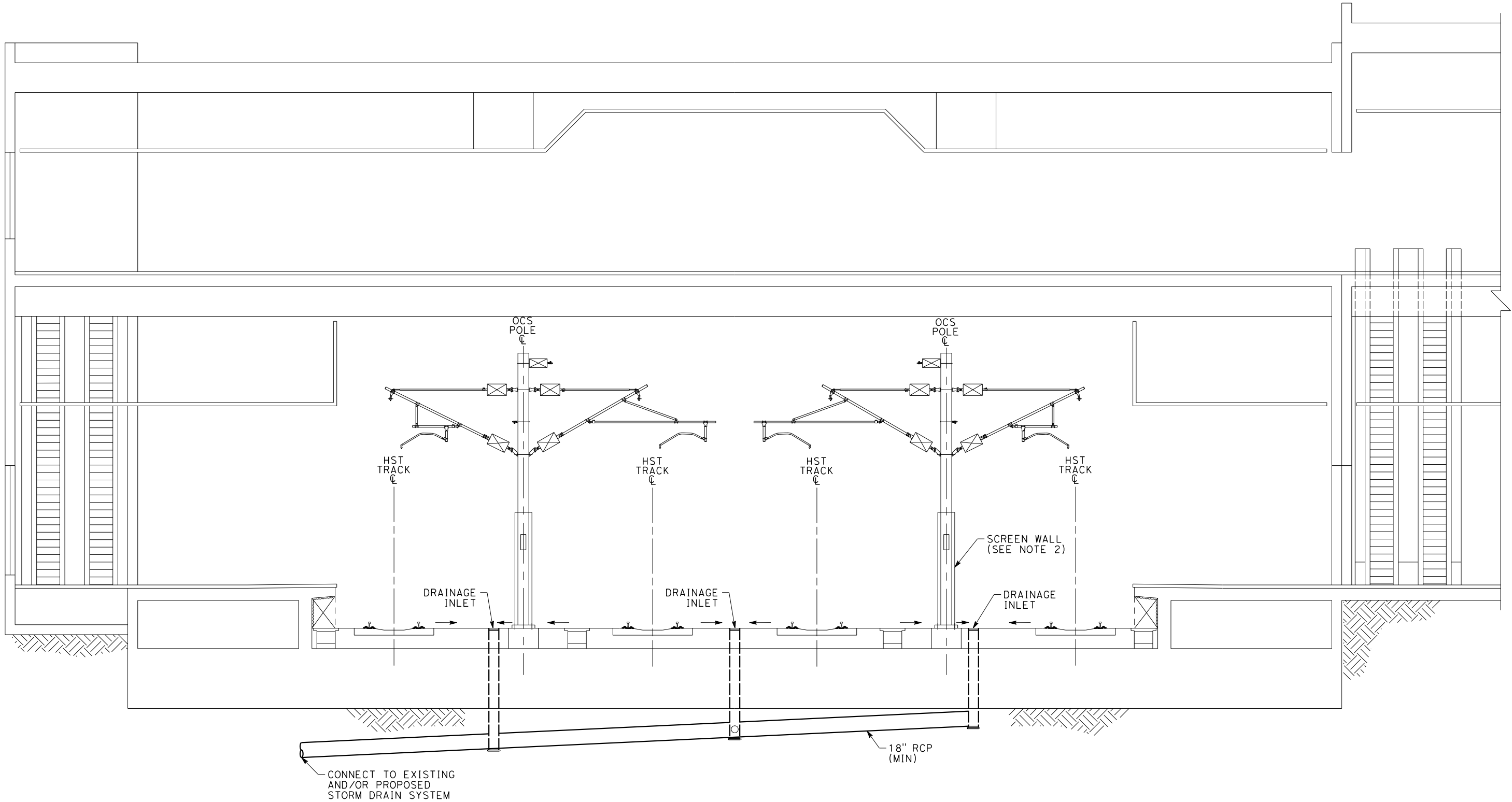
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE**

AT-GRADE TRACK
DRAINAGE SYSTEM

CONTRACT NO.
DRAWING NO. DD-CD-003
SCALE NO SCALE
SHEET NO.

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Huante



- NOTES:**
1. TRACK, SYSTEMS AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. PROVIDE DRAIN SLOTS UNDER SCREEN WALL FOR DRAINAGE. INLETS SHALL BE AT THE LOW POINT AND UNDER THE SCREEN WALL.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY K. SISTLA
DRAWN BY V. HUANTE
CHECKED BY A. ABTAHI
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

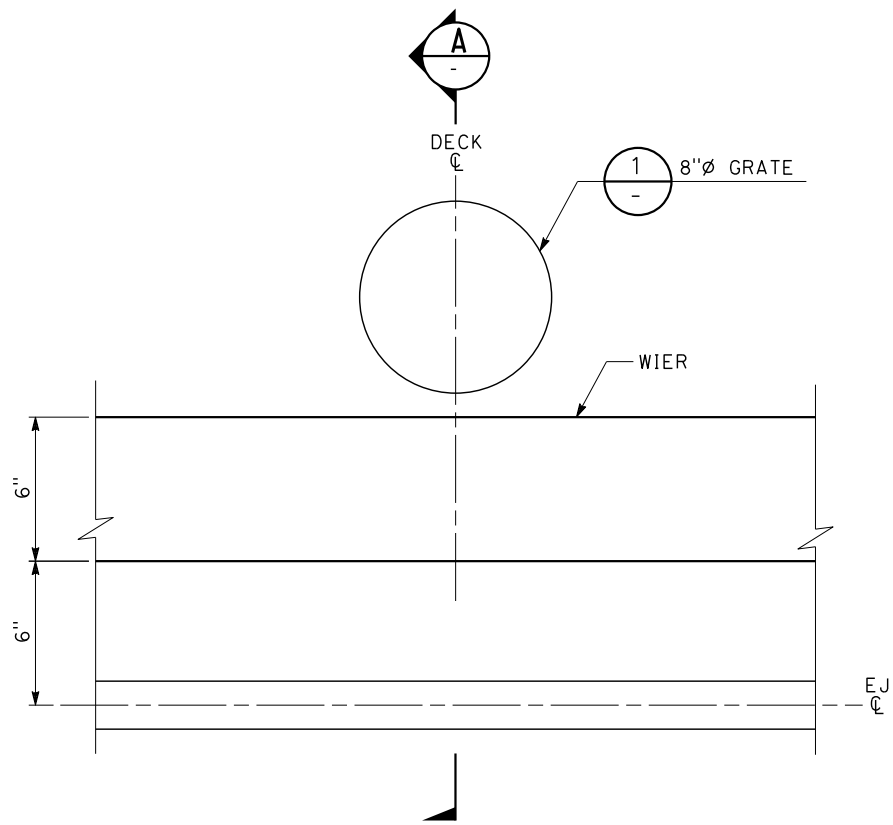
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE**

AT-GRADE STATION PLATFORM
DRAINAGE SYSTEM

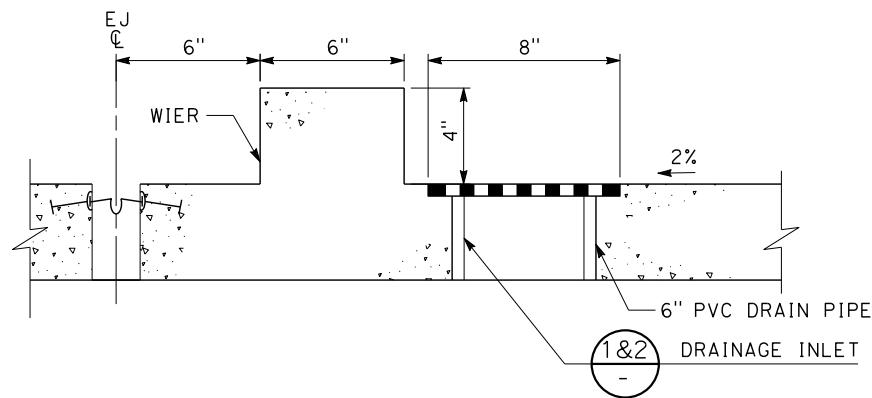
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05/14/2013 HSR 13-06 - EXECUTION VERSION

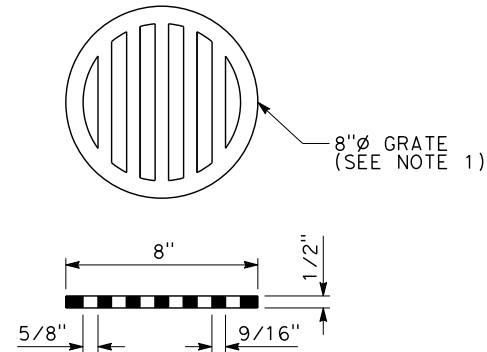
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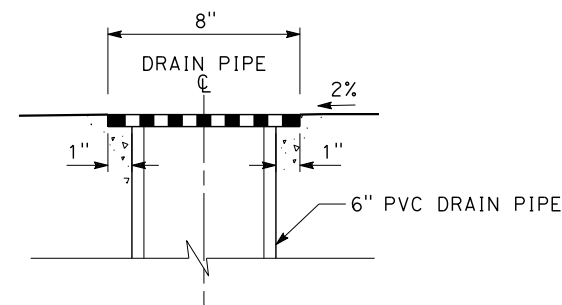
PLAN
DRAINAGE INLET ON AERIAL STRUCTURE DECK
NO SCALE



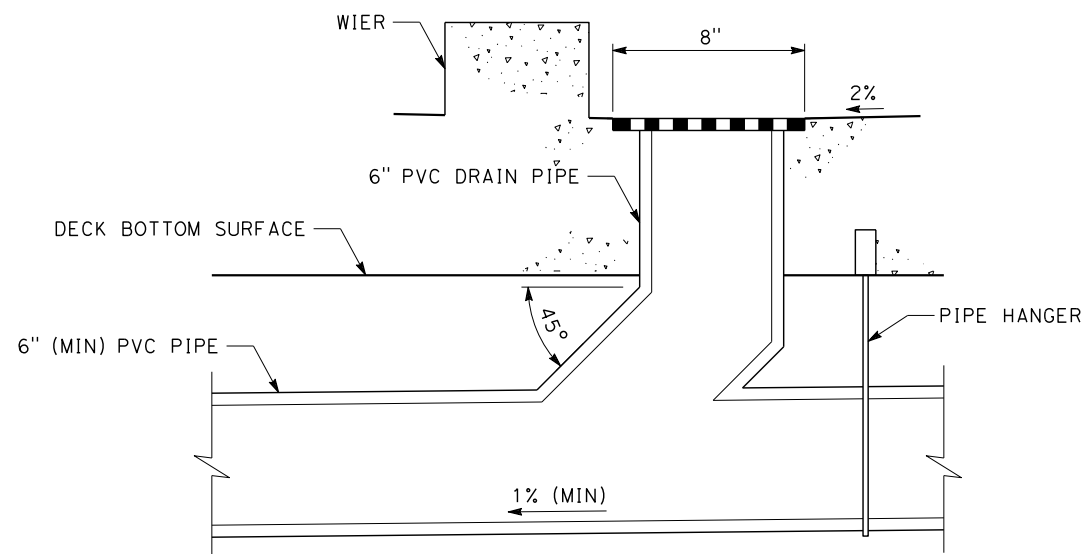
SECTION
NO SCALE



DETAIL
NO SCALE



DETAIL
VERTICAL INLET
NO SCALE



DETAIL
45° ANGLE INLET
NO SCALE

NOTES:

1. DRAIN GRATES SHALL BE SECURELY CONNECTED TO THE INLET.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY K. SISTLA
DRAWN BY T. DOUNG
CHECKED BY A. ABTAHI
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
DRAINAGE DIRECTIVE**

AERIAL STRUCTURE BRIDGE DECK
DRAINAGE INLET DETAIL

CONTRACT NO.
DRAWING NO. DD-CD-005
SCALE NO SCALE
SHEET NO.

05/14/2013
HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project

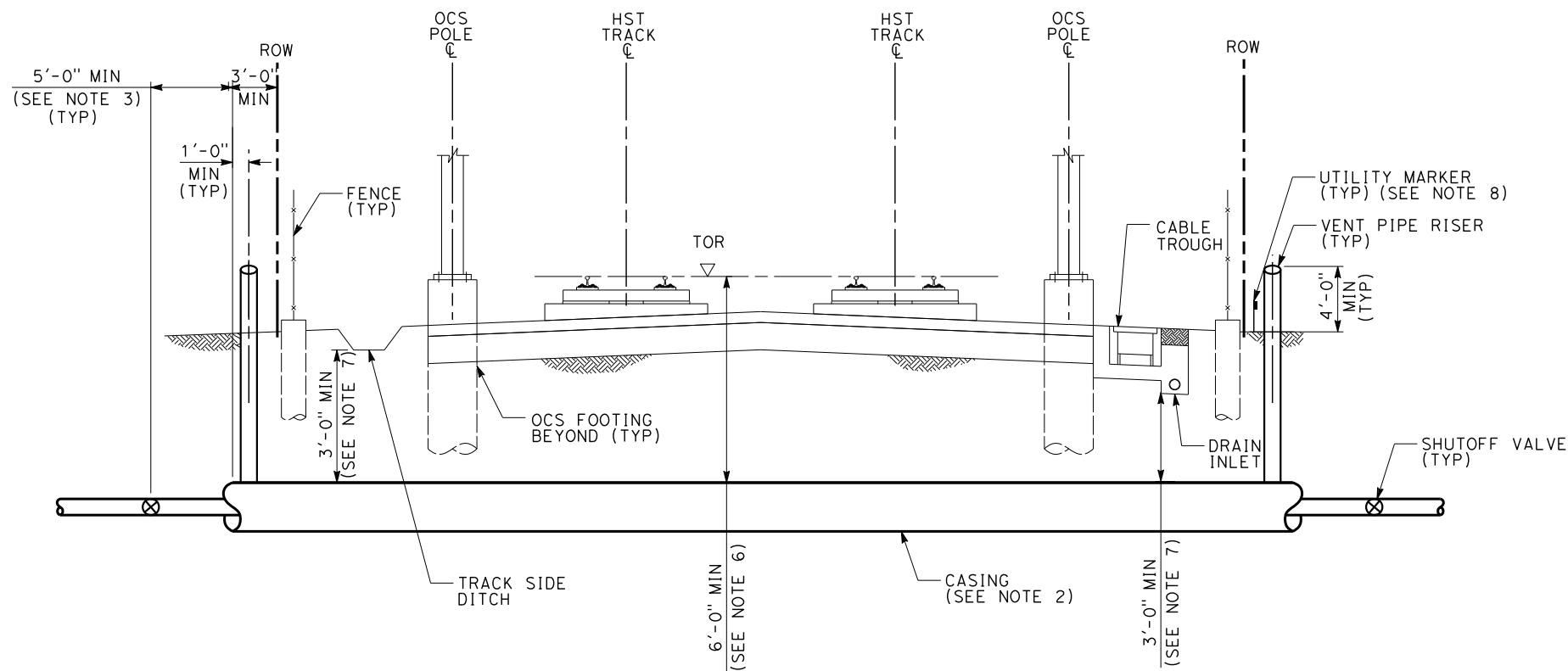


Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Utility

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NOTES:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR ADDITIONAL REQUIREMENTS, SEE AREMA MANUAL.
3. SHUTOFF VALVE MUST BE ACCESSIBLE FROM OUTSIDE THE RIGHT OF WAY. IT MAY NOT BE REQUIRED ON BOTH SIDES.
4. THE CASING SHALL CONTINUE 3 FEET BEYOND THE RIGHT OF WAY.
5. TRANSVERSE UTILITIES SHALL BE LOCATED AWAY FROM MANHOLES, OCS FOOTINGS, AND OTHER HST SUBSURFACE ELEMENTS.
6. MINIMUM CLEARANCE FOR GAS TRANSMISSION PIPELINE CROSSING SHALL BE 10'-6" BELOW TOP OF RAIL.
7. MINIMUM CLEARANCE FOR UNDERGROUND WIRE LINE CROSSING, OVER 750 VOLTS, SHALL BE 4'-0" AND FOR GAS TRANSMISSION PIPELINE CROSSING SHALL BE 6'-0" BELOW DRAINAGE FACILITIES.
8. UTILITY MARKER TO INDICATE LOCATION OF UTILITY CROSSING AT RIGHT-OF-WAY.



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
DRAWN BY H. NGUYEN
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



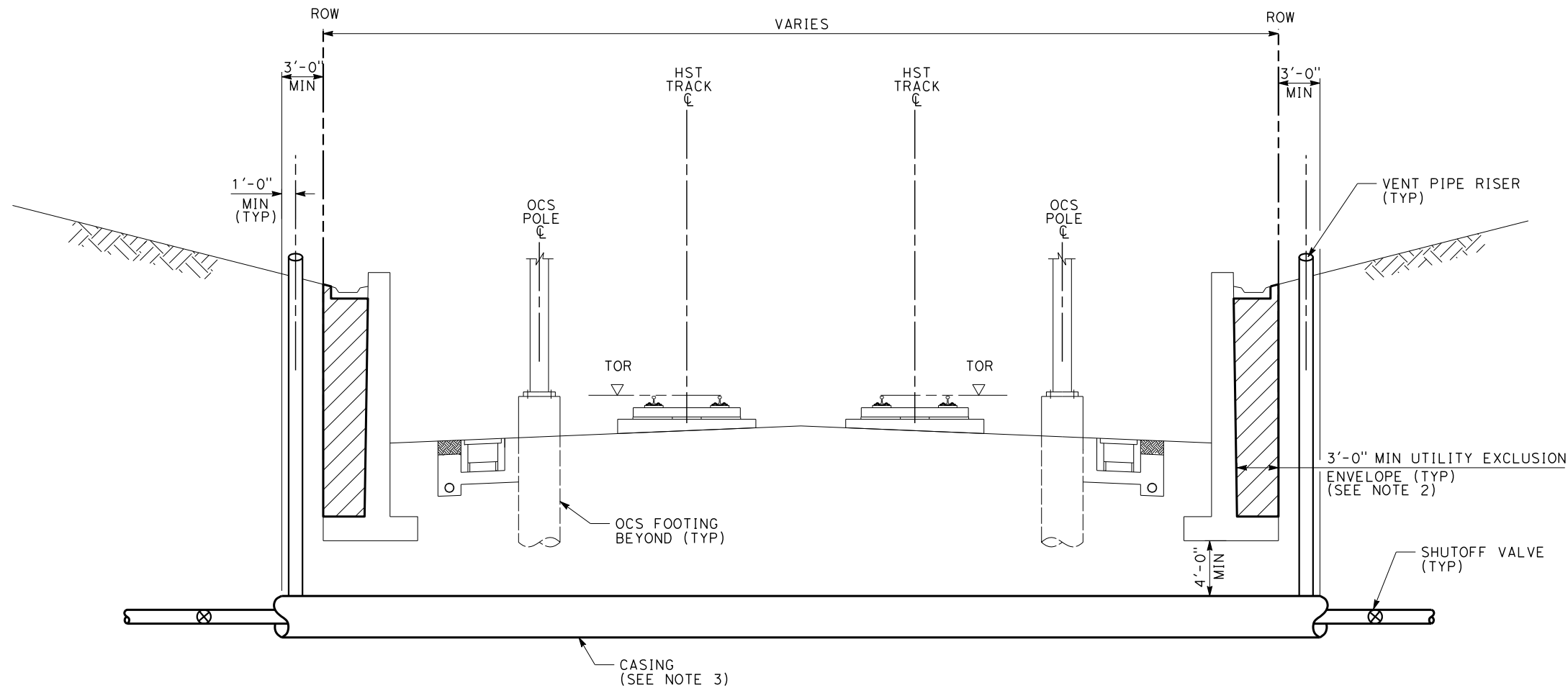
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE**

UTILITY CROSSING CLEARANCES
AT GRADE

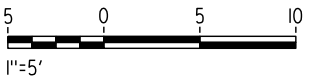
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SCALE AS SHOWN
SHEET NO.

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HuanTe



NOTES:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. NO UTILITIES ABOVE THE WALL FOOTINGS.
3. FOR ADDITIONAL REQUIREMENTS, SEE AREMA MANUAL.
4. TRANSVERSE UTILITIES SHALL BE LOCATED AWAY FROM MANHOLES, OCS FOOTINGS, AND OTHER HST SUBSURFACE ELEMENTS.



A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ABTAHI
DRAWN BY D. SO
CHECKED BY S. MILITELLO
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE**

UTILITIES CROSSING CLEARANCES
RETAINED CUT TRENCH

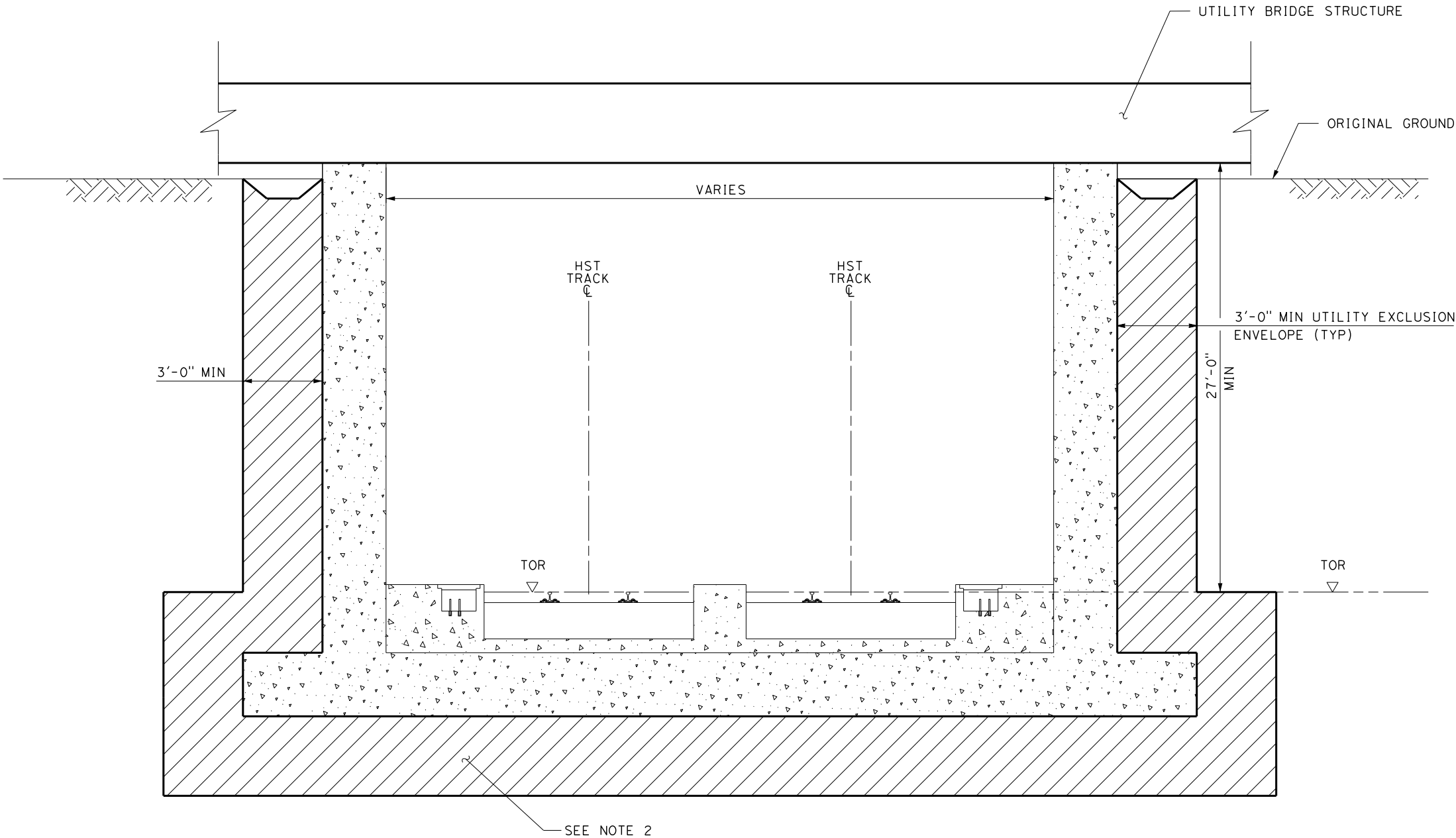
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SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

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NOTE:

1. TRACK, SYSTEMS, DRAINAGE, AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. NO UTILITIES ABOVE THE WALL FOOTING AND TRENCH DEEPER THAN 8'-0" FROM ORIGINAL GROUND.



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A	05/31/13				EXECUTION VERSION

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IN CHARGE J. CHIRCO
DATE 07/12/2013

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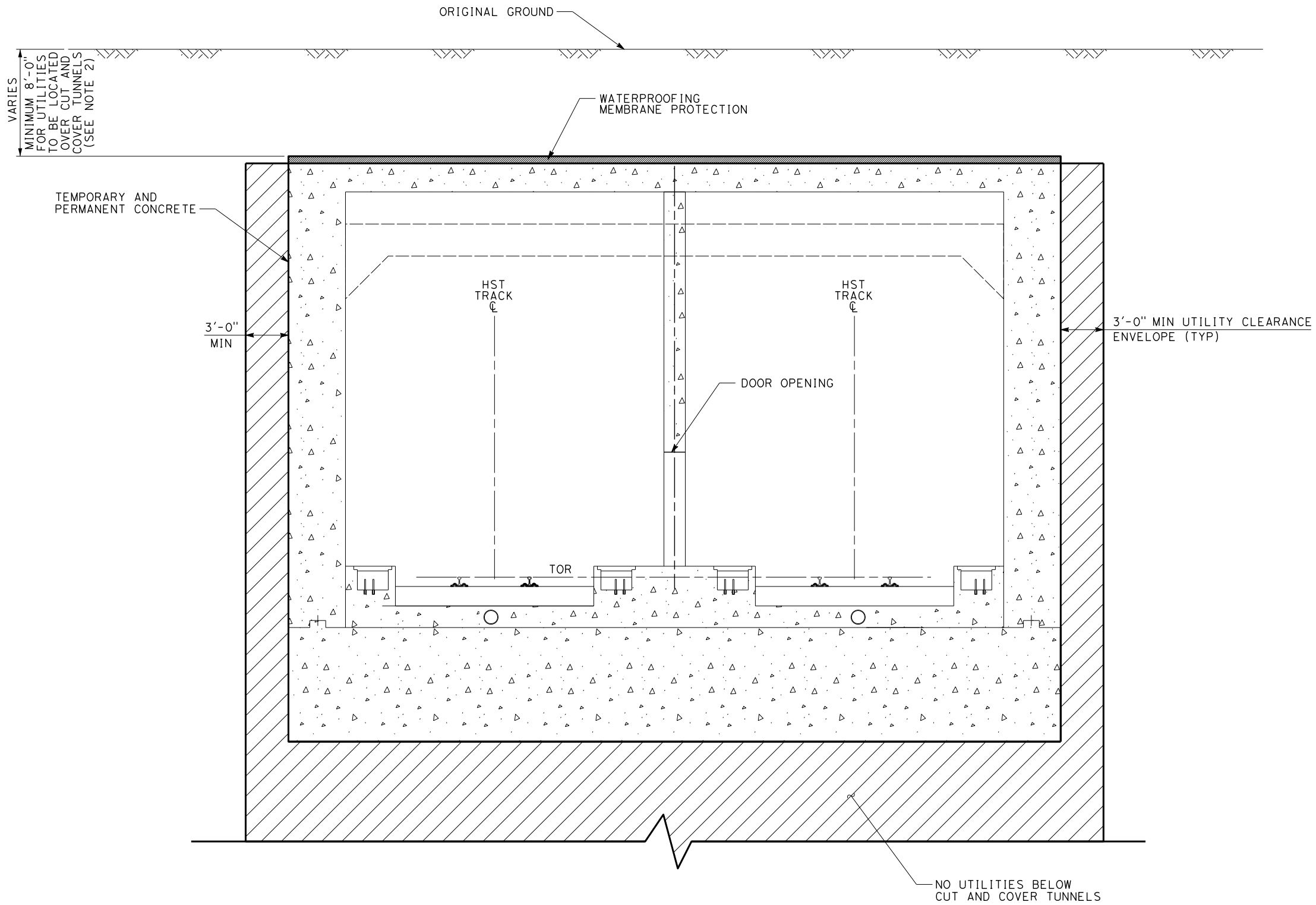
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE**

UTILITY CROSSING CLEARANCES
TRENCH

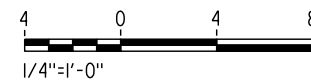
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HuanTe



NOTES:

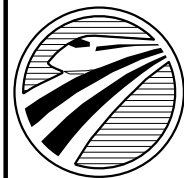
1. TRACK, SYSTEMS, DRAINAGE AND STRUCTURES ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. BOTTOM OF UTILITY PIPE OR CASING SHALL BE A MINIMUM OF 12 INCHES ABOVE THE WATERPROOFING MEMBRANE.



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A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
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IN CHARGE J. CHIRCO
DATE 07/12/2013

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BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
UTILITIES DIRECTIVE**

UTILITY CROSSING CLEARANCES
CUT AND COVER TUNNELS

CONTRACT NO.
DRAWING NO. DD-UT-004
SCALE AS SHOWN
SHEET NO.

California High-Speed Train Project

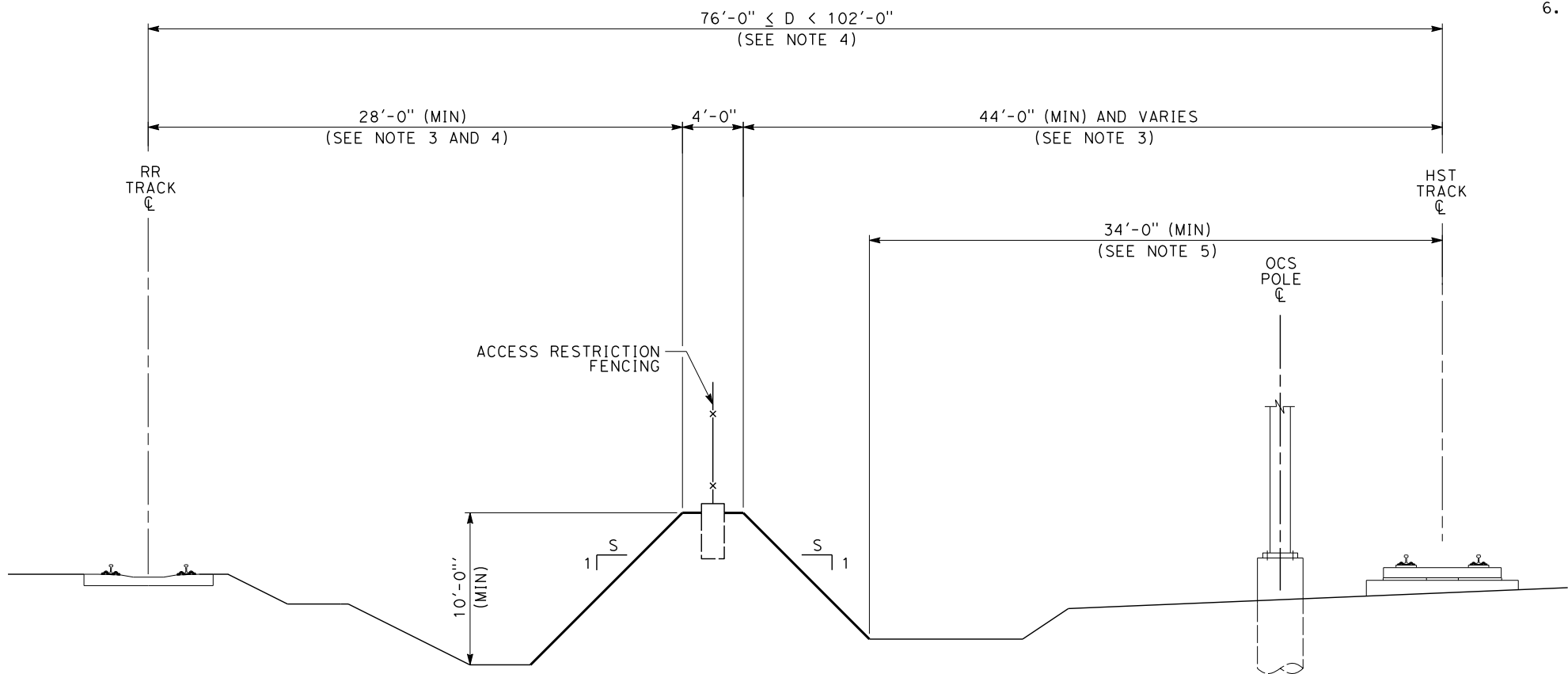


Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Intrusion Protection

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EARTHWORK BERM

- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. SIDE SLOPES (S/1) DETERMINED THROUGH SLOPE STABILITY ANALYSIS. FOR COMMON EARTH MATERIAL ONLY, USE 2:1 SIDE SLOPES.
 3. MINIMUM DISTANCE IS BASED ON S=1.
 4. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.
 5. MINIMUM DISTANCE TO BERM INCLUDES SPACE FOR DRAINAGE DITCH BETWEEN THE BERM AND TRACK BED TOE OF SLOPE.
 6. BERM MATERIAL AND COMPACTION SHALL BE SIMILAR TO EMBANKMENT.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	A. ABTAHI
DRAWN BY	T. DOUNG
CHECKED BY	H. NGUYEN
IN CHARGE	J. CHIRCO
DATE	07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

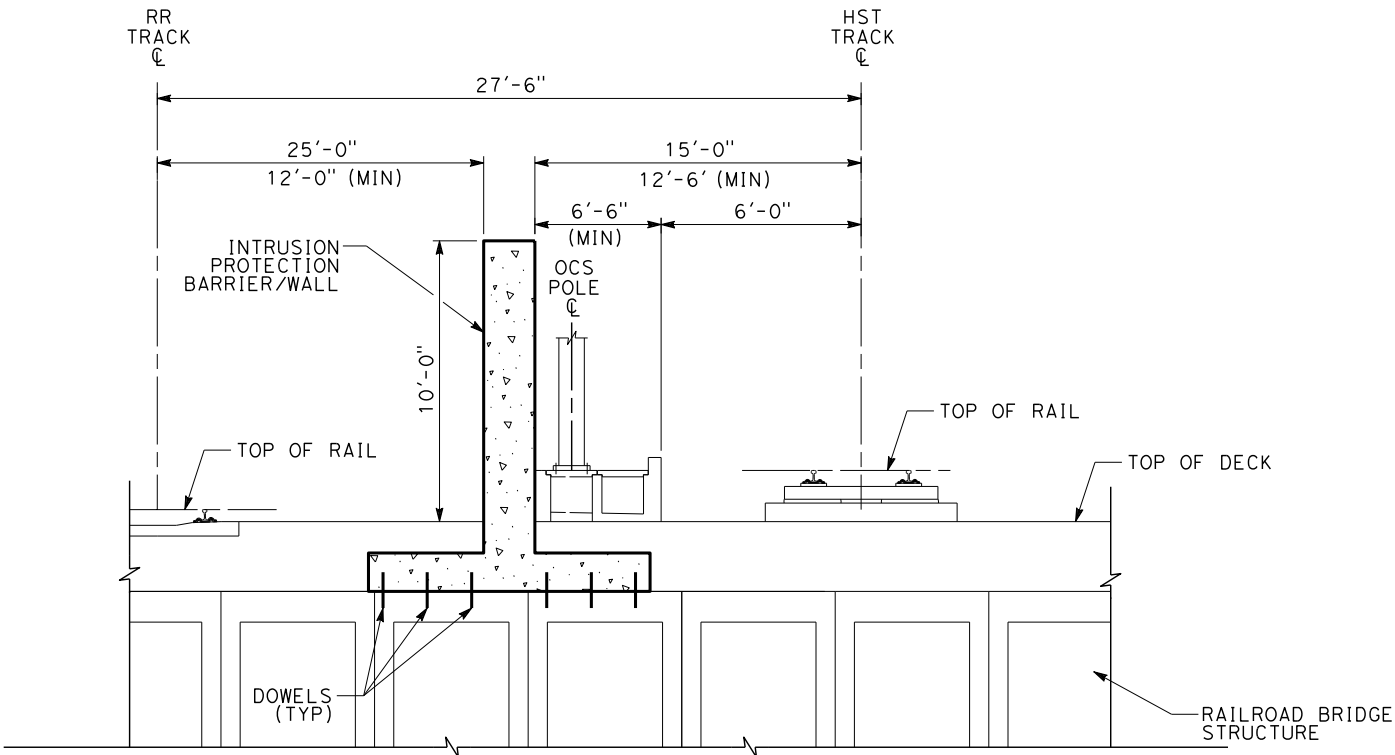
CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE

EARTHWORK BERM
RAILROAD ADJACENT TO HST

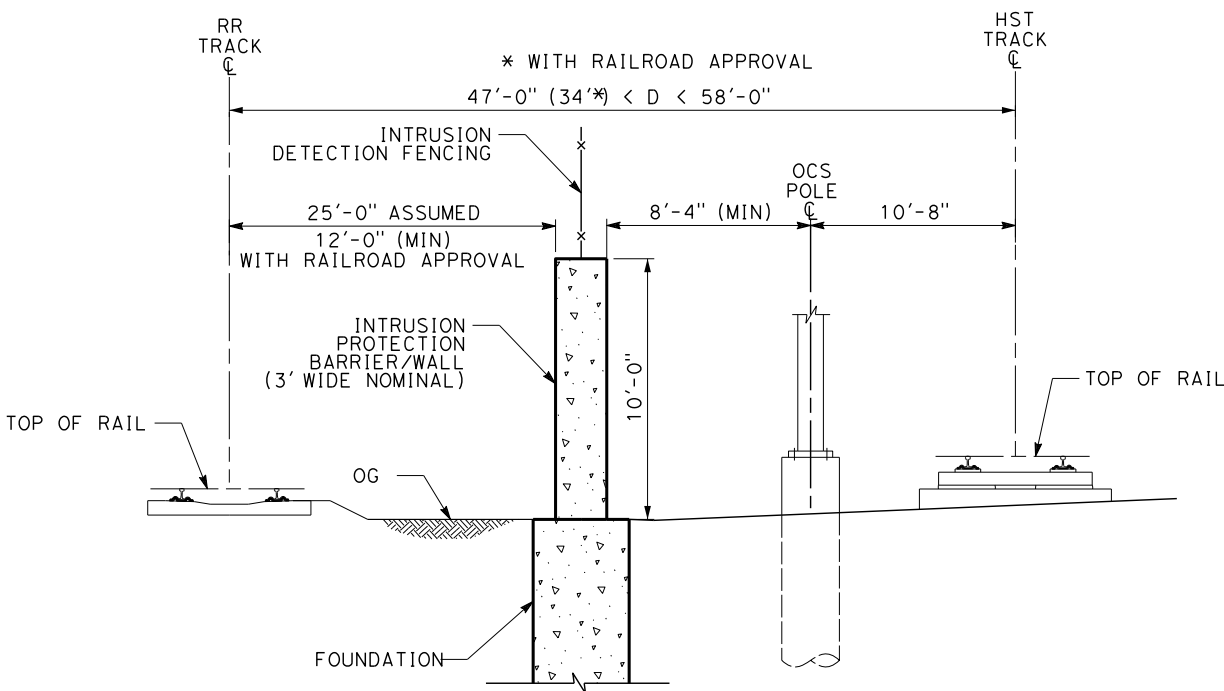
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NOTES:
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.



ELEVATED SHARED CORRIDOR



AT-GRADE SHARED CORRIDOR

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
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DATE 07/12/2013

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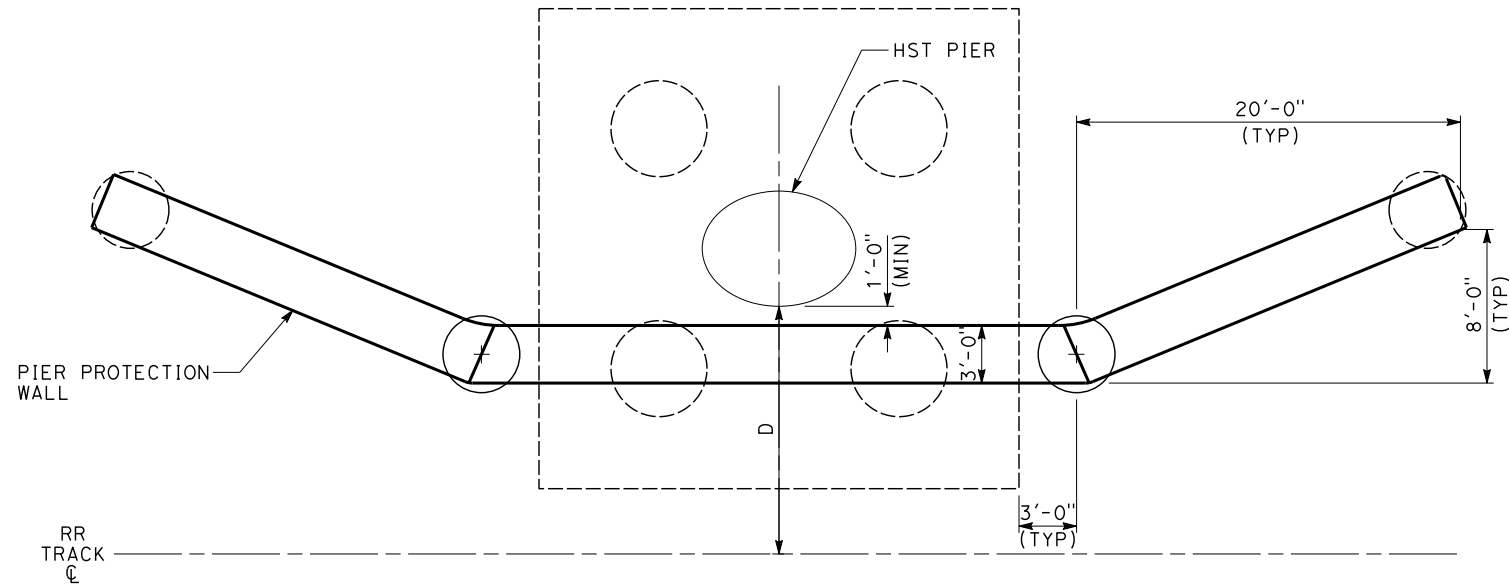
CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE

BARRIERS IN SHARED CORRIDOR

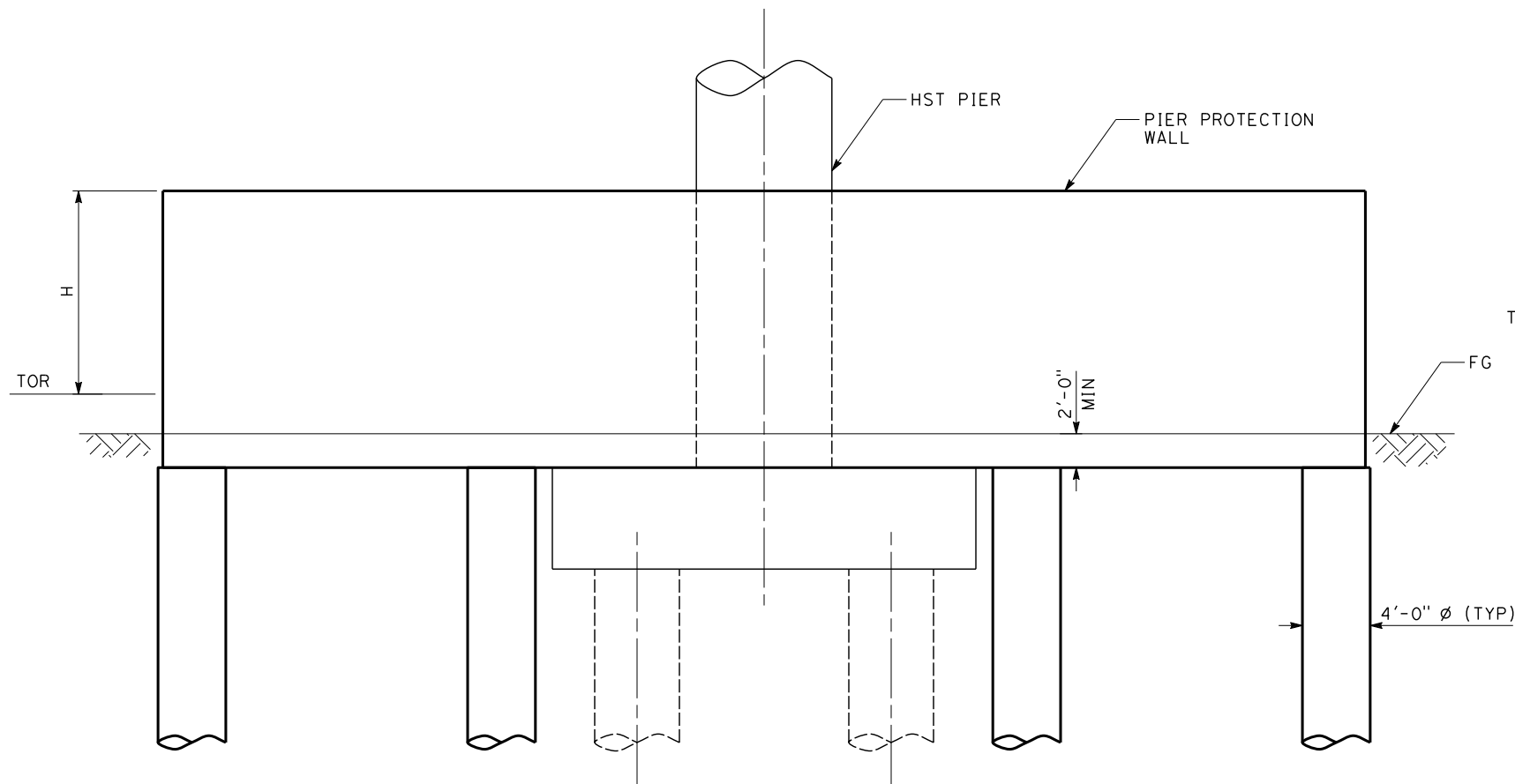
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SCALE NO SCALE
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

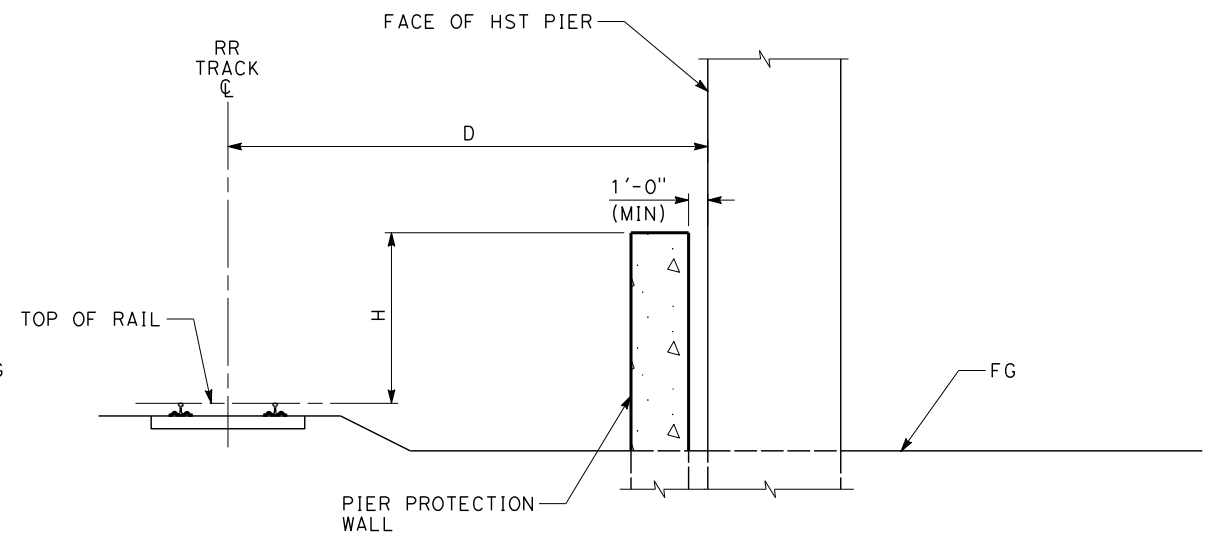
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PLAN



ELEVATION



HST STRUCTURE PIER - PROTECTION WALL

CLEARANCE (D)	WALL HEIGHT ABOVE TOP OF RAIL (H)
≥ 25 FT	N/A
12 FT - 25 FT	6 FT
≤ 12 FT	12 FT



NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. PIER PROTECTION WALL MAY BE REQUIRED IF CLEARANCE FROM FACE OF HST STRUCTURE TO NEAREST RR TRACK CENTERLINE IS LESS THAN 25 FEET.
3. LOCATION WHERE BARRIER IS REQUIRED SHALL BE DETERMINED THROUGH SITE SPECIFIC HAZARD ANALYSES.

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A	05/31/13				EXECUTION VERSION

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IN CHARGE J. CHIRCO
DATE 07/12/2013

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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

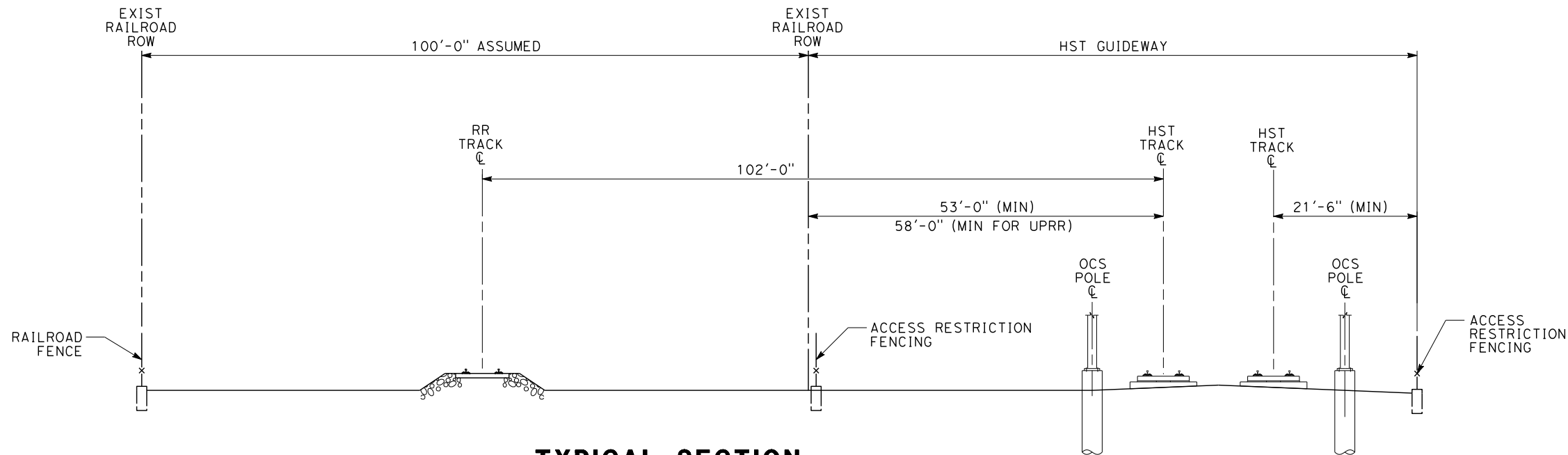
CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE

HST PIER PROTECTION
IN RAILROAD RIGHT OF WAY

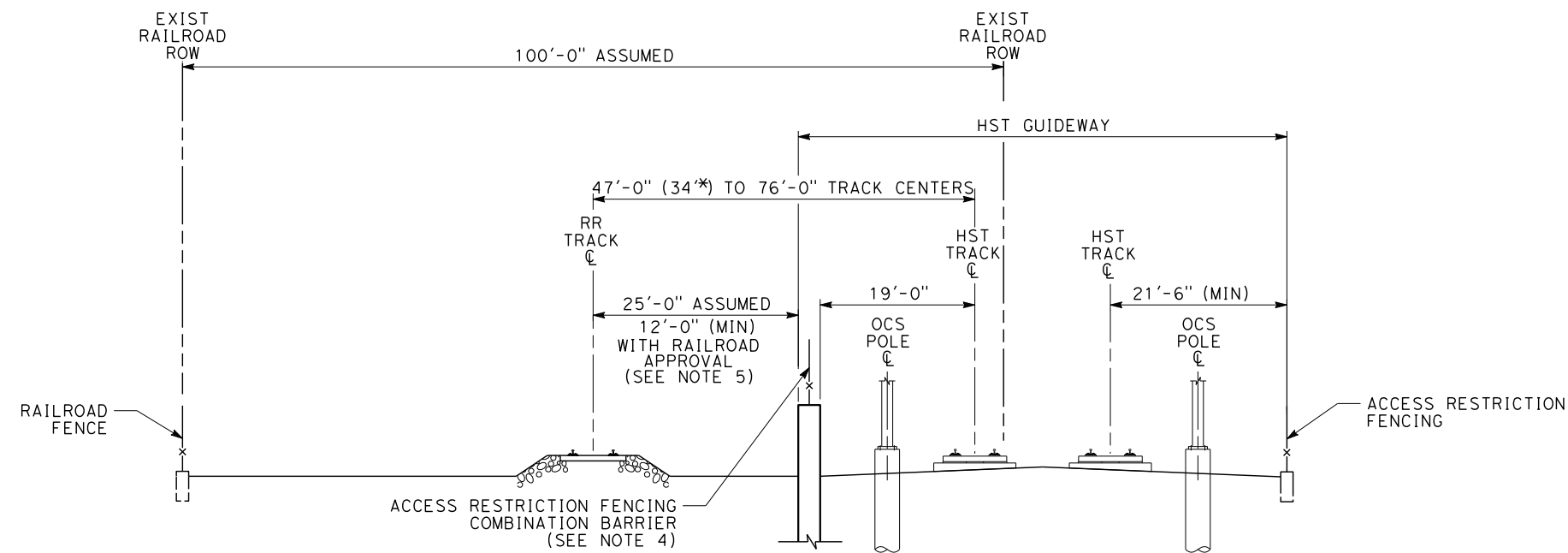
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05/14/2013 HSR 13-06 - EXECUTION VERSION

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TYPICAL SECTION
ADJACENT CORRIDOR
NO INTRUSION PROTECTION REQUIRED



* WITH RAILROAD APPROVAL

TYPICAL SECTION
IN SHARED CORRIDOR
INTRUSION PROTECTION - CONCRETE BARRIER

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. RIGHT-OF-WAY REQUIRED FOR THE HIGH-SPEED RAIL GUIDEWAY WILL DEPEND UPON CONDITIONS ALONG THE ALIGNMENT, INCLUDING TERRAIN, CUT/FILL SLOPES, RETAINING STRUCTURES, AND REQUIRED ACCESS.
3. ASSUMES RAILROAD CENTERLINE IS 50 FEET FROM EXISTING RAILROAD RIGHT-OF-WAY.
4. AR FENCE COMBINATION BARRIER SHALL BE INSTALLED INSIDE AUTHORITY RIGHT-OF-WAY.
5. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
DRAWN BY T. DOUNG
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IN CHARGE J. CHIRCO
DATE 07/12/2013

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BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

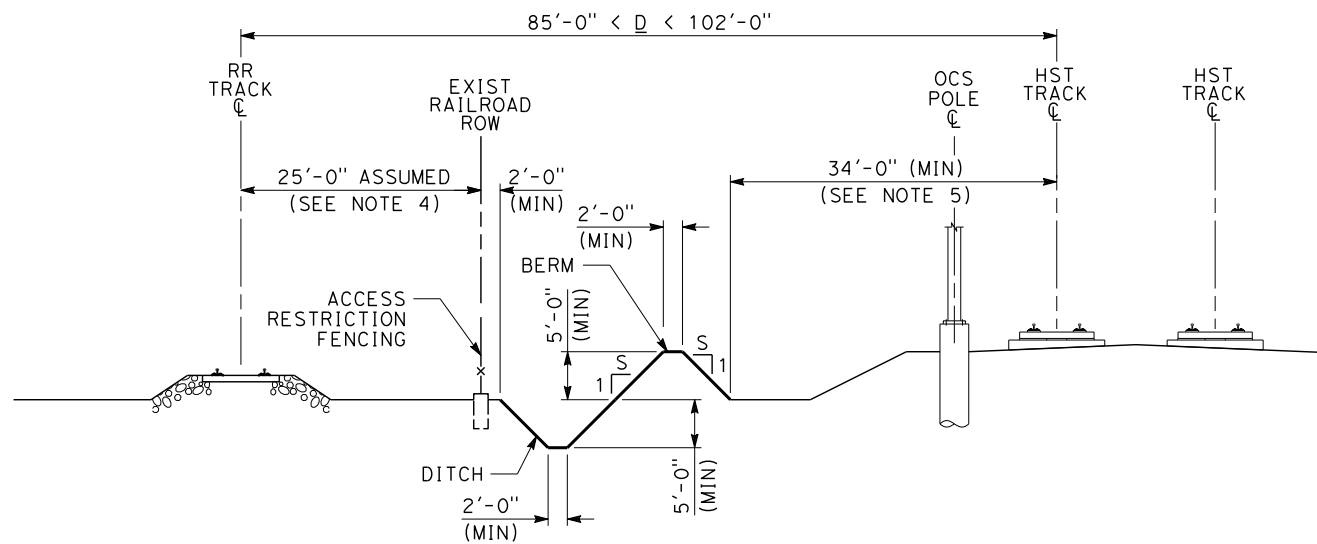
IN SHARED AND ADJACENT CORRIDOR
AT-GRADE

CONTRACT NO.
DRAWING NO. DD-IP-004
SCALE NO SCALE
SHEET NO.

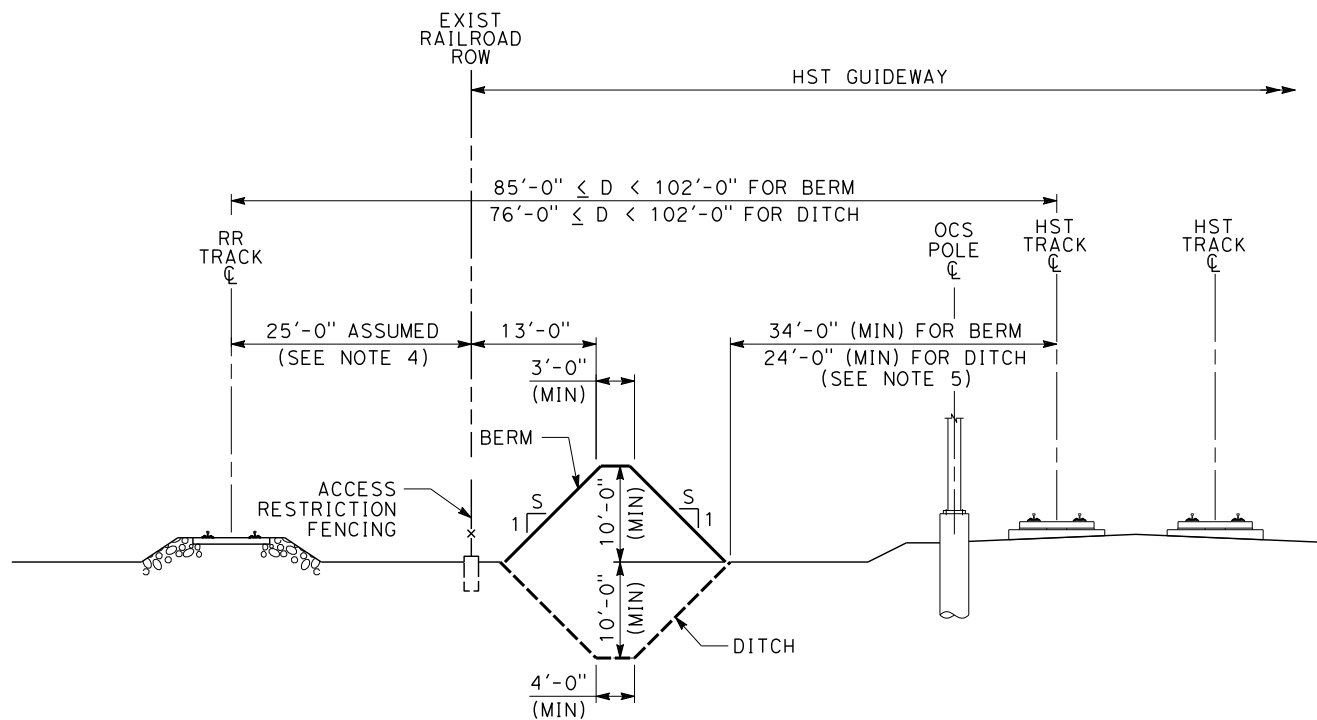
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TYPICAL SECTION
EARTHEN BERM AND DITCH



TYPICAL SECTION
EARTHEN BERM OR DITCH

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SIDE SLOPES (S/1) DETERMINED THROUGH SLOPE STABILITY ANALYSIS. FOR COMMON EARTH MATERIAL ONLY, USE 2:1 SIDE SLOPES.
3. MINIMUM DISTANCE IS BASED ON S=1.
4. OFFSET TO TRACK AND LOCATION OF INTRUSION PROTECTION BARRIER WITHIN CONVENTIONAL RAILROAD RIGHT-OF-WAY REQUIRES APPROVAL FROM THE RAILROAD.
5. MINIMUM DISTANCE TO BERM INCLUDES SPACE FOR DRAINAGE DITCH BETWEEN THE BERM AND TRACK BED TOE OF SLOPE.
6. BERM MATERIAL AND COMPACTION SHALL BE SIMILAR TO EMBANKMENT.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	A. ABTAHI
DRAWN BY	T. DOUNG
CHECKED BY	H. NGUYEN
IN CHARGE	J. CHIRCO
DATE	07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

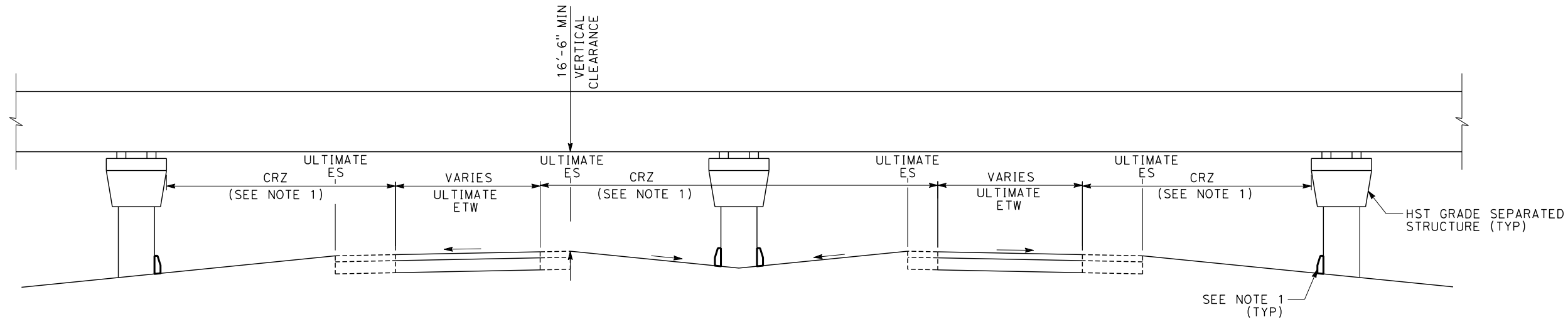
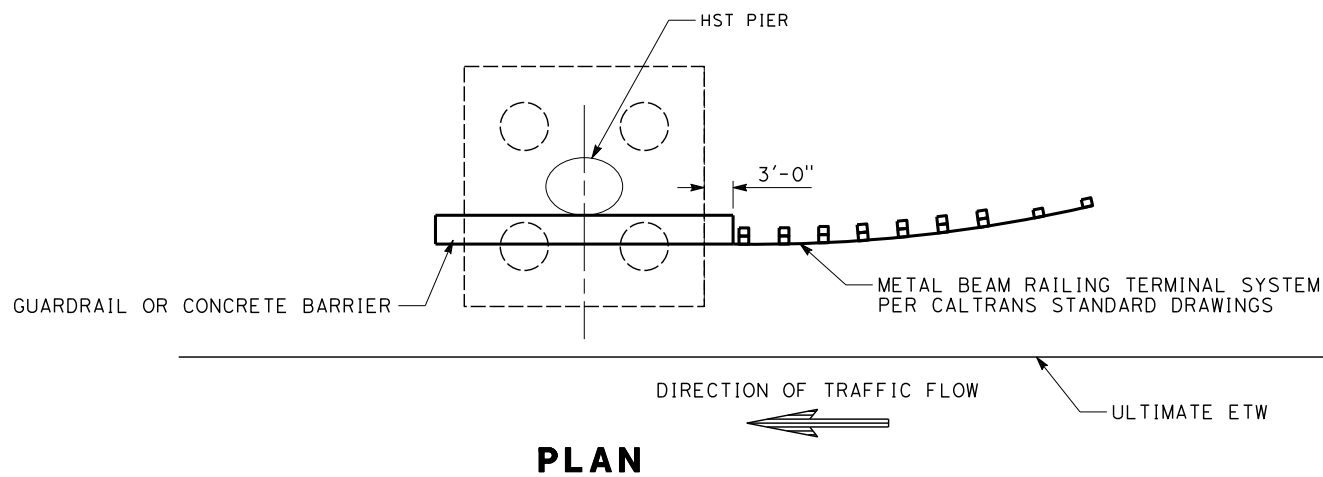
AT-GRADE BERM OR DITCH ON HST GUIDEWAY
RAILROAD ADJACENT TO HST

CONTRACT NO.
DRAWING NO. DD-IP-005
SCALE NO SCALE
SHEET NO.

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HST GRADE SEPARATED STRUCTURE OVER HIGHWAY/ROADWAY WITH MEDIAN

NOTES:

1. METAL BEAM GUARDRAIL OR CONCRETE BARRIER MAY BE REQUIRED AT HST FIXED OBJECT IF THE DISTANCE FROM ULTIMATE ETW TO HST FIXED OBJECT IS LESS THAN 30 FEET. REFER TO CHAPTER 7 OF CALTRANS TRAFFIC MANUAL. IF METAL BEAM GUARDRAIL IS USED, IT SHALL BE 3 FEET FROM FACE OF PIER. REFER TO CALTRANS STANDARD PLAN NSP A77C5 FOR VEGETATION CONTROL.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY A. ABTAHI
DRAWN BY T. DOUNG
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**

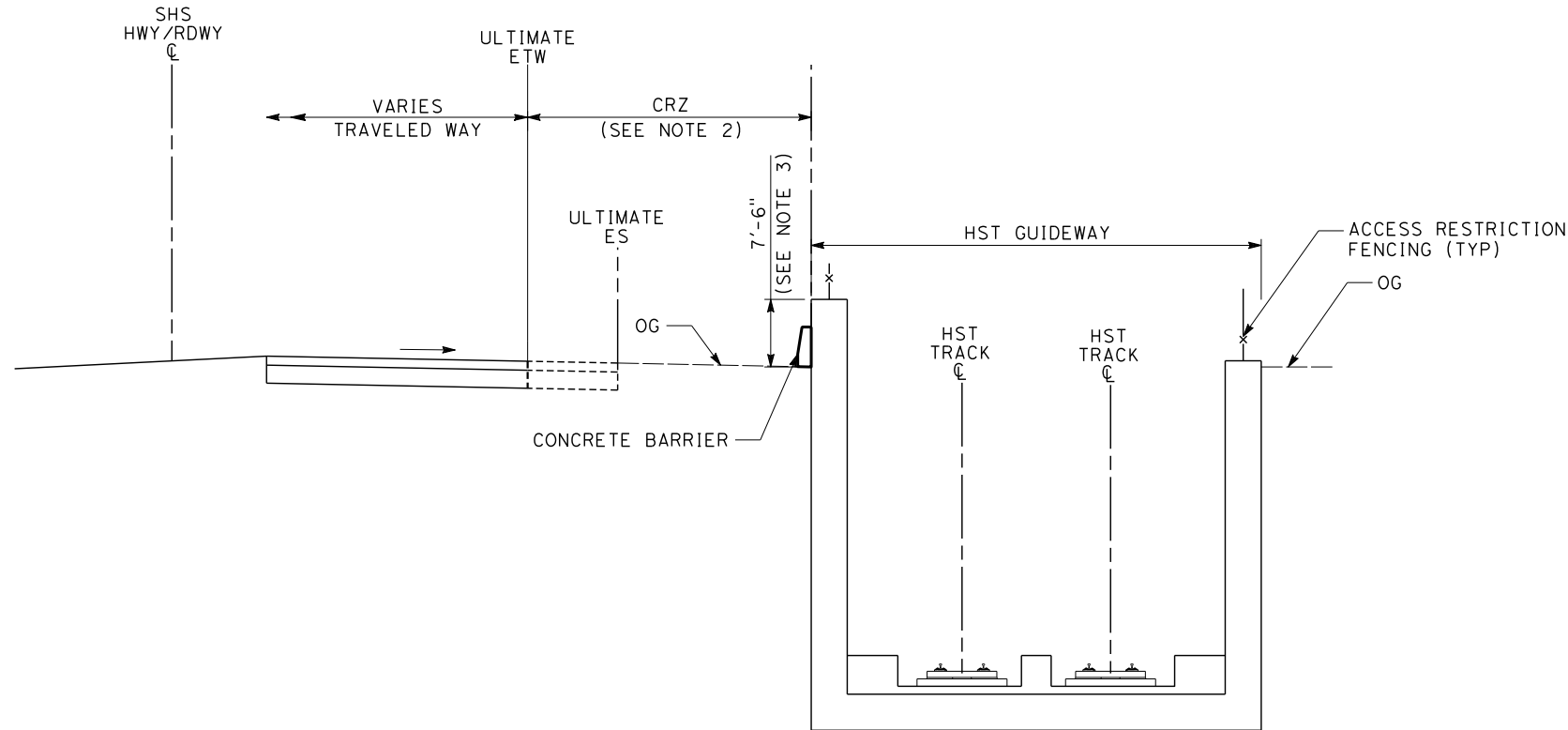


**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

HST PIER PROTECTION
IN HIGHWAY/ROADWAY RIGHT-OF-WAY

CONTRACT NO.
DRAWING NO. DD-IP-006
SCALE NO SCALE
SHEET NO.

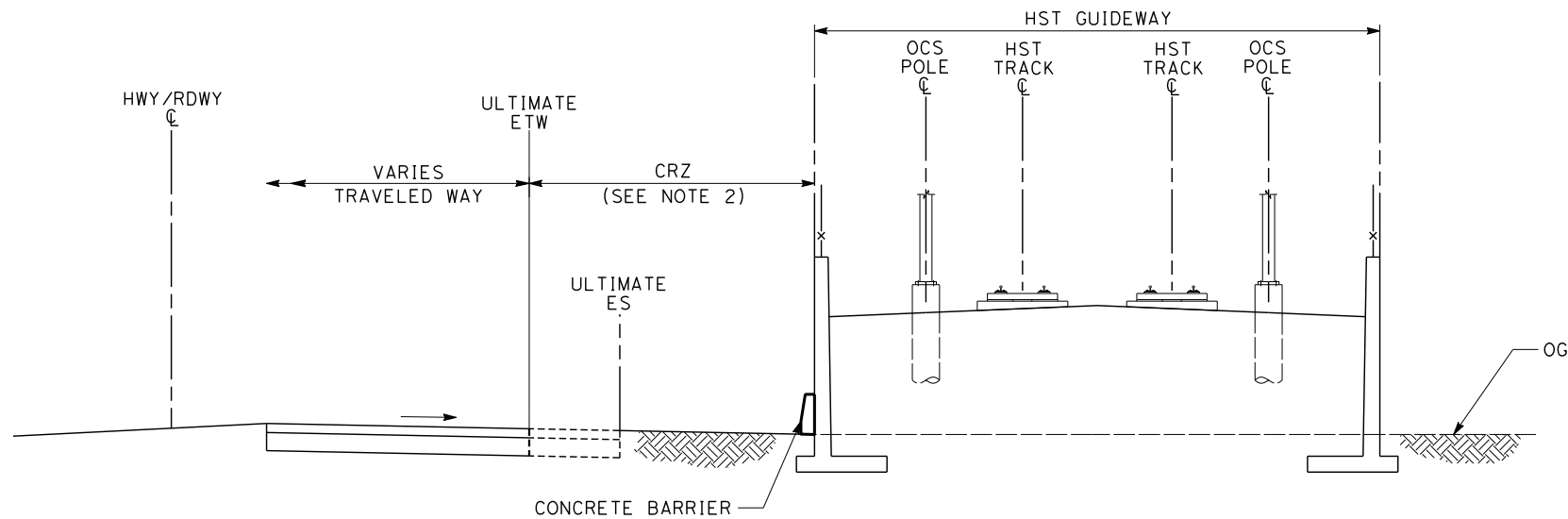
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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SAFETY SHAPE BARRIER SHALL BE INCLUDED IN CONSTRUCTION OF THE WALL IF THE HST WALL IS LESS THAN 52 FEET FROM THE ULTIMATE ETW.
3. FHWA RECOMMENDS 7.5 FEET VERTICAL BARRIER TO CONTAIN HIGH CENTER OF GRAVITY CARGO TRUCKS WITHIN HIGHWAY RIGHT-OF-WAY.

HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST TRENCH



HIGHWAY/ROADWAY AT GRADE ADJACENT TO HST RETAINED FILL



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
DRAWN BY T. DOUNG
CHECKED BY H. NGUYEN
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

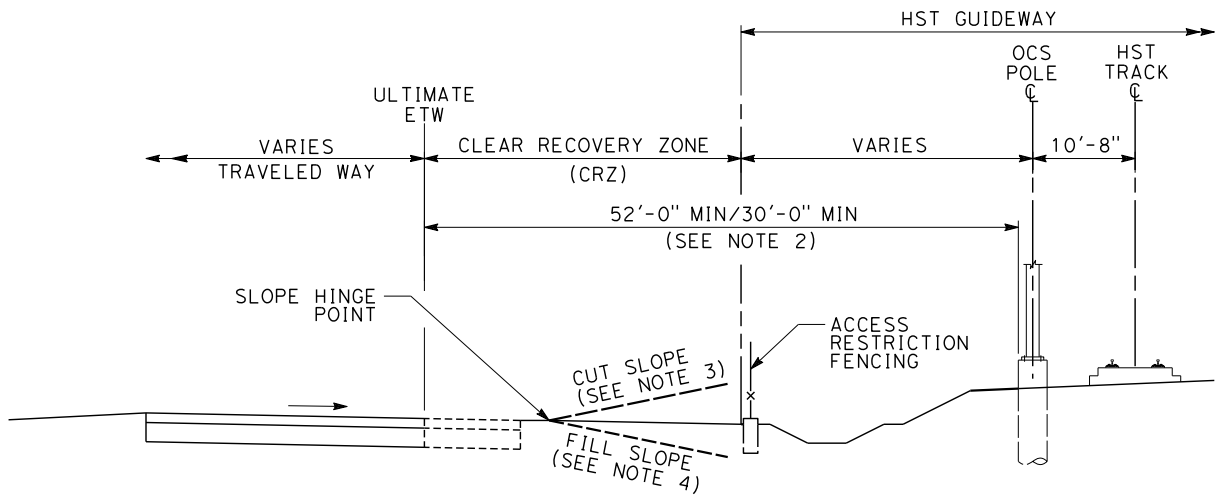
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE**

HST TRENCH AND RETAINING WALL PROTECTION

CONTRACT NO.
DRAWING NO. DD-IP-007
SCALE AS SHOWN
SHEET NO.

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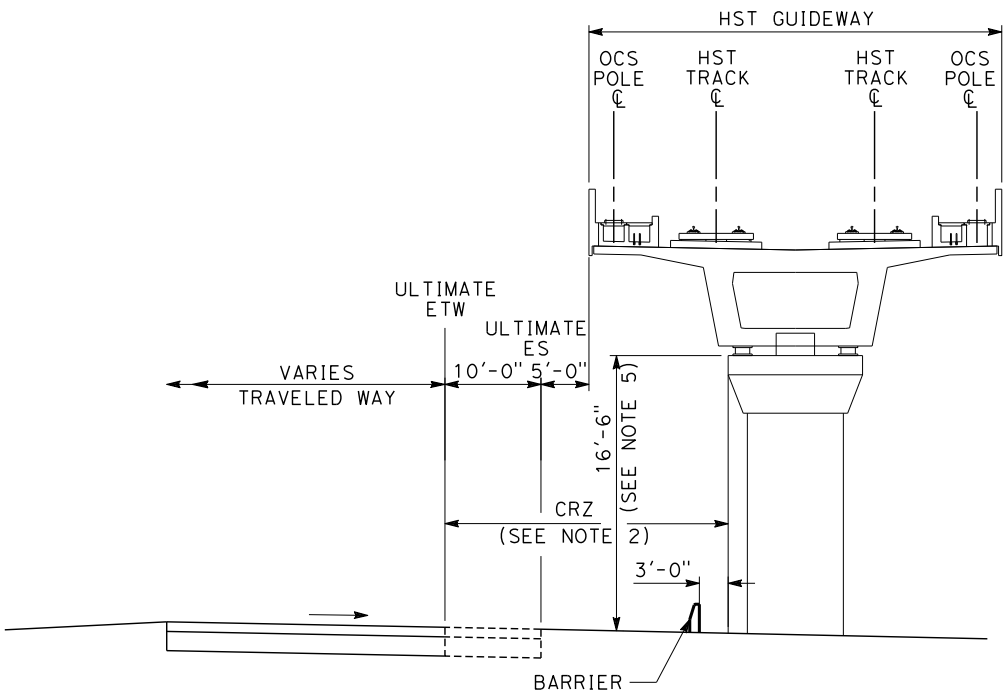
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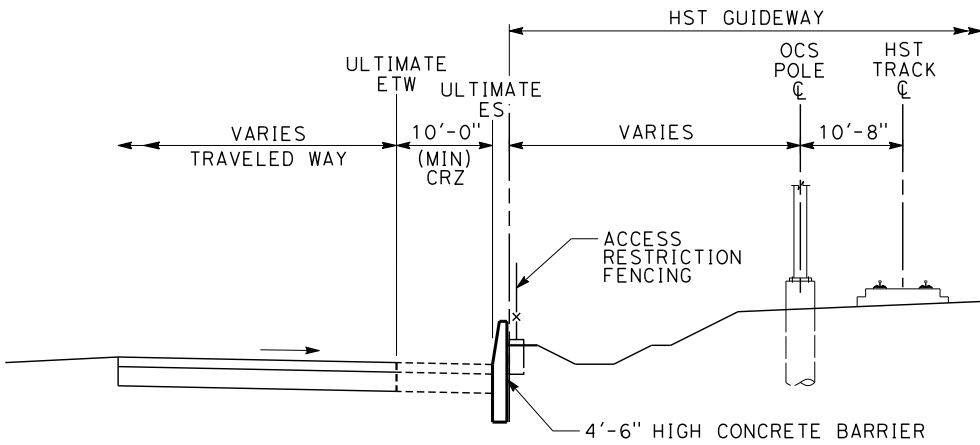
HST AT GRADE ADJACENT TO HIGHWAY/ROADWAY

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. WHEN HST CORRIDOR IS CONSTRUCTED LONGITUDINALLY TO A FREEWAY, EXPRESSWAY, OR HIGHWAY, METAL BEAM GUARDRAIL OR CONCRETE BARRIER MAY BE REQUIRED AT HST FIXED OBJECT IF THE DISTANCE FROM ULTIMATE ETW TO HST AERIAL STRUCTURE COLUMN, OR ANY HST FIXED OBJECT, IS LESS THAN 52 FEET. IF HST CORRIDOR IS NOT LONGITUDINAL TO A FREEWAY, EXPRESSWAY, OR HIGHWAY, THE CLEARANCE REQUIREMENT TO A HST FIXED OBJECT IS 30 FEET. REFER TO CALTRANS HDM CHAPTER 3 AND CALTRANS TRAFFIC MANUAL CHAPTER 7.
3. IF HEIGHT DIFFERENTIAL AT ROADWAY CUT SLOPE HINGE POINT AND HST ROW FENCE IS GREATER THE 4 FEET, NO GUARDRAIL IS REQUIRED. A 4 FEET HEIGHT DIFFERENTIAL IN A 4:1 CUT SLOPE PROVIDES A GREATER EFFECTIVE SIDE SLOPE THAN A 7.5 FEET VERTICAL BARRIER RECOMMENDED BY THE FHWA.
4. IF THE HEIGHT DIFFERENTIAL AT ROADWAY FILL HINGE POINT AND HSR ROW FENCE WITH A 2:1 SLOPE IS GREATER THAN 10 FT, GUARDRAIL WILL BE REQUIRED AT ROADWAY FILL HINGE POINT (REFER TO CHAPTER 7 OF CALTRANS TRAFFIC MANUAL, FIGURE 7-1 FOR RECOMMENDED PLACEMENT OF GUARDRAIL ALONG EMBANKMENT.
5. IF THE VERTICAL CLEARANCE BETWEEN THE RECOVERY AREA AND THE HST STRUCTURE BENT CAP IS LESS THAN 16.5 FEET, METAL BEAM GUARDRAIL OR CONCRETE BARRIER WILL BE REQUIRED 3 FEET FROM ULTIMATE HIGHWAY EDGE OF SHOULDER.



HST AERIAL STRUCTURE ADJACENT TO HIGHWAY/ROADWAY



HST AT GRADE ADJACENT TO HIGHWAY/ROADWAY
WITH 10 FEET CLEAR RECOVERY ZONE (CRZ)

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY A. ABTAHI
DRAWN BY T. DOUNG
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IN CHARGE J. CHIRCO
DATE 07/12/2013

PARSONS
BRINCKERHOFF



CALIFORNIA HIGH-SPEED TRAIN PROJECT
INTRUSION PROTECTION DIRECTIVE

ADJACENT TO HIGHWAY/ROADWAY

CONTRACT NO.
DRAWING NO. DD-IP-008
SCALE NO SCALE
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project

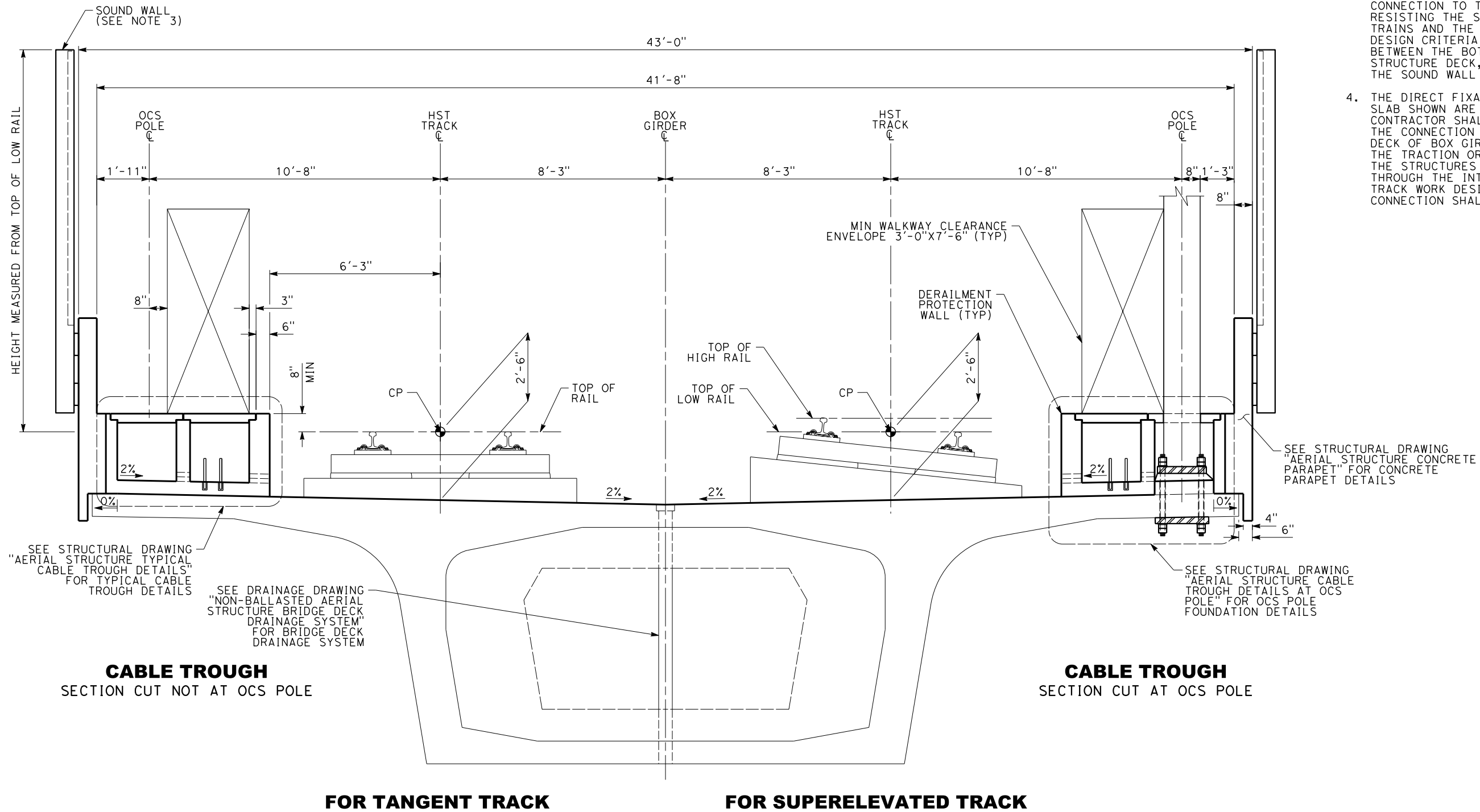


Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Structural

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- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. ON CURVED ALIGNMENT, THE RELATIVE DIMENSIONS BETWEEN BRIDGE DECK AND BOX GIRDER SHALL BE ADJUSTED PROPERLY. IF A STRAIGHT DECK EDGE IS SELECTED, THE WIDER DECK WIDTH MAY BE REQUIRED.
 3. THE HEIGHT OF THE SOUND WALL SHALL BE DETERMINED BASED ON RESULTS FROM THE NOISE ATTENUATION STUDY. THE SOUND WALL ITSELF AND ITS CONNECTION TO THE STRUCTURE SHALL BE CAPABLE OF RESISTING THE SLIPSTREAM EFFECTS FROM PASSING TRAINS AND THE WIND LOADS AS DESCRIBED IN THE DESIGN CRITERIA. NO GAP SHALL BE PERMITTED BETWEEN THE BOTTOM OF SOUND WALL AND THE STRUCTURE DECK, NOR ANY VERTICAL GAPS BETWEEN THE SOUND WALL PANELS.
 4. THE DIRECT FIXATION RAIL SYSTEM AND THE TRACK SLAB SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL CONSIDER IN THEIR DESIGN THAT THE CONNECTION BETWEEN THE TRACK SLAB AND TOP DECK OF BOX GIRDER IS CAPABLE OF TRANSFERRING THE TRACTION OR BRAKING FORCES AS DESCRIBED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA THROUGH THE INTERFACE COORDINATION WITH THE TRACK WORK DESIGNER. ANY EMBEDDED ITEMS OF THIS CONNECTION SHALL BE INSTALLED BY THE CONTRACTOR.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY P. LIN
DRAWN BY J. GO
CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

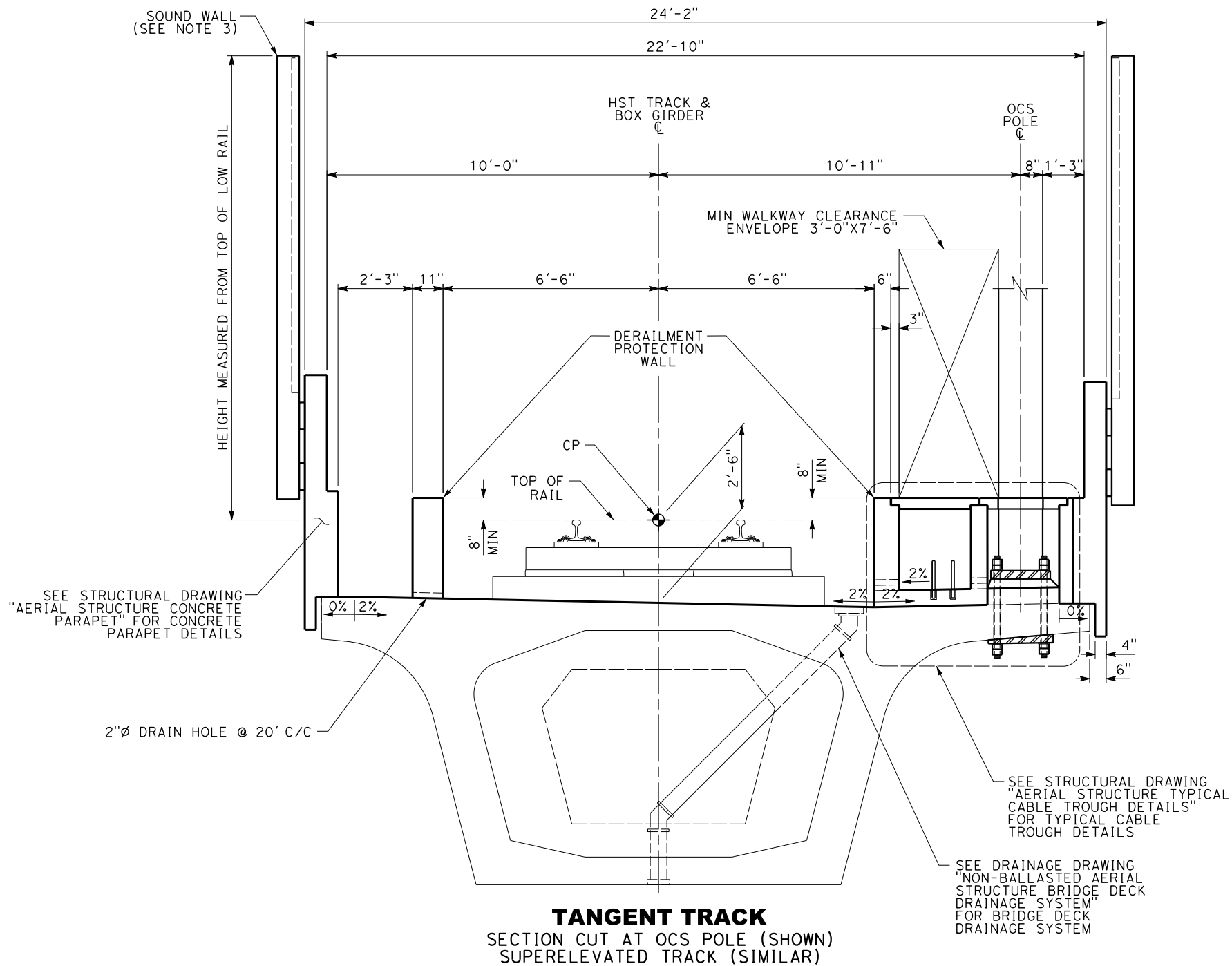
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

AERIAL STRUCTURE
TWO TRACK NON-BALLASTED
TYPICAL CONFIGURATION ON TOP OF DECK

CONTRACT NO.
DRAWING NO. DD-ST-001
SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. ON CURVED ALIGNMENT, THE RELATIVE DIMENSIONS BETWEEN BRIDGE DECK AND BOX GIRDER SHALL BE ADJUSTED PROPERLY. IF A STRAIGHT DECK EDGE IS SELECTED, THE WIDER DECK WIDTH MAY BE REQUIRED.
3. THE HEIGHT OF THE SOUND WALL SHALL BE DETERMINED BASED ON RESULTS FROM THE NOISE ATTENUATION STUDY. THE SOUND WALL ITSELF AND ITS CONNECTION TO THE STRUCTURE SHALL BE CAPABLE OF RESISTING THE SLIPSTREAM EFFECTS FROM PASSING TRAINS AND THE WIND LOADS AS DESCRIBED IN THE DESIGN CRITERIA. NO GAP SHALL BE PERMITTED BETWEEN THE BOTTOM OF SOUND WALL AND THE STRUCTURE DECK, NOR ANY VERTICAL GAPS BETWEEN THE SOUND WALL PANELS.
4. THE DIRECT FIXATION RAIL SYSTEM AND THE TRACK SLAB SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL CONSIDER IN THEIR DESIGN THAT THE CONNECTION BETWEEN THE TRACK SLAB AND TOP DECK OF BOX GIRDER IS CAPABLE OF TRANSFERRING THE TRACTION OR BRAKING FORCES AS DESCRIBED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA THROUGH THE INTERFACE COORDINATION WITH THE TRACK WORK DESIGNER. ANY EMBEDDED ITEMS OF THIS CONNECTION SHALL BE INSTALLED BY THE CONTRACTOR.



REV	DATE	BY	CHK	APP	DESCRIPTION
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DESIGNED BY P. LIN
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IN CHARGE J. CHIRCO
DATE 07/12/2013

**PARSONS
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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

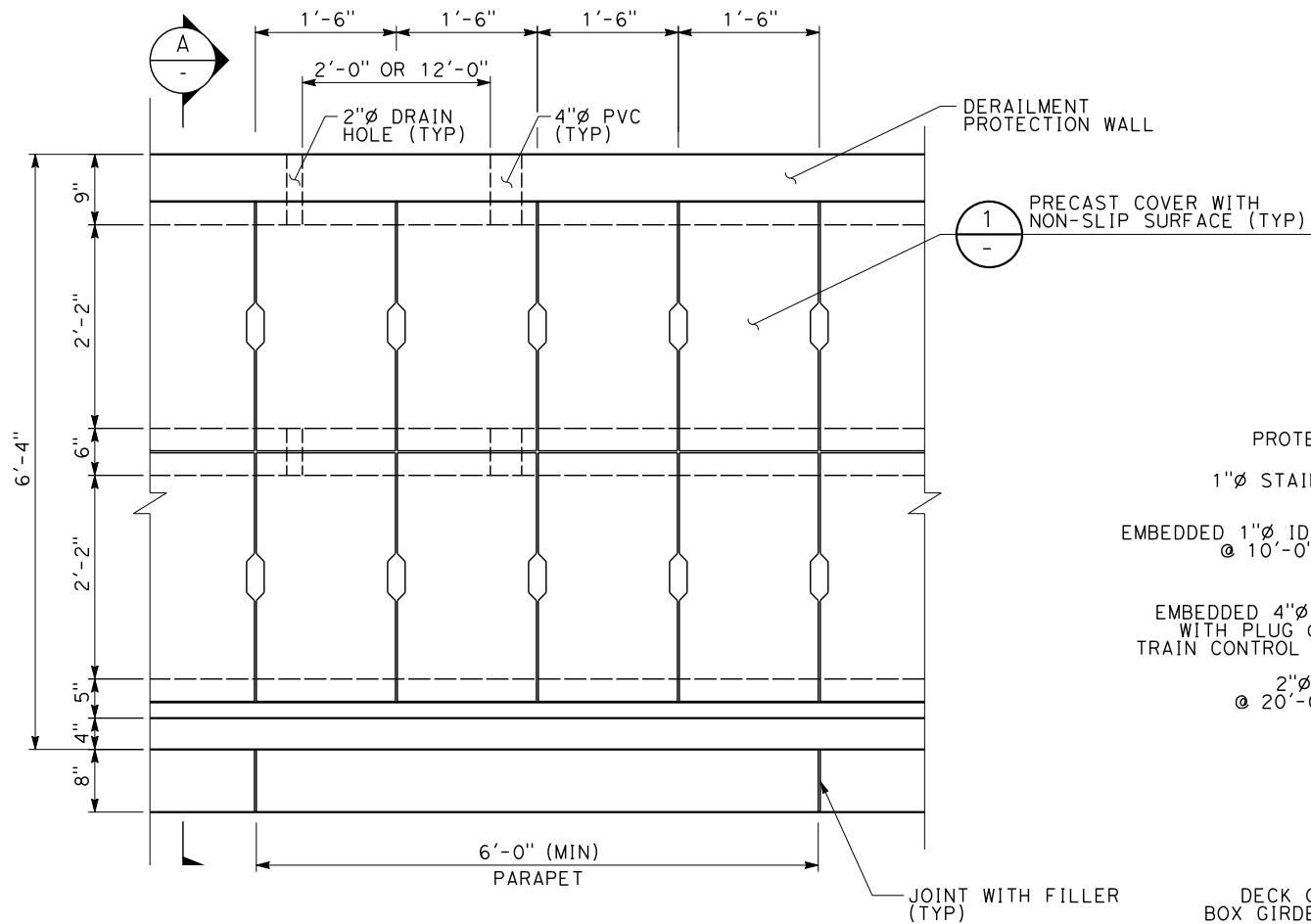
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

AERIAL STRUCTURE
ONE TRACK NON-BALLASTED
TYPICAL CONFIGURATION ON TOP OF DECK

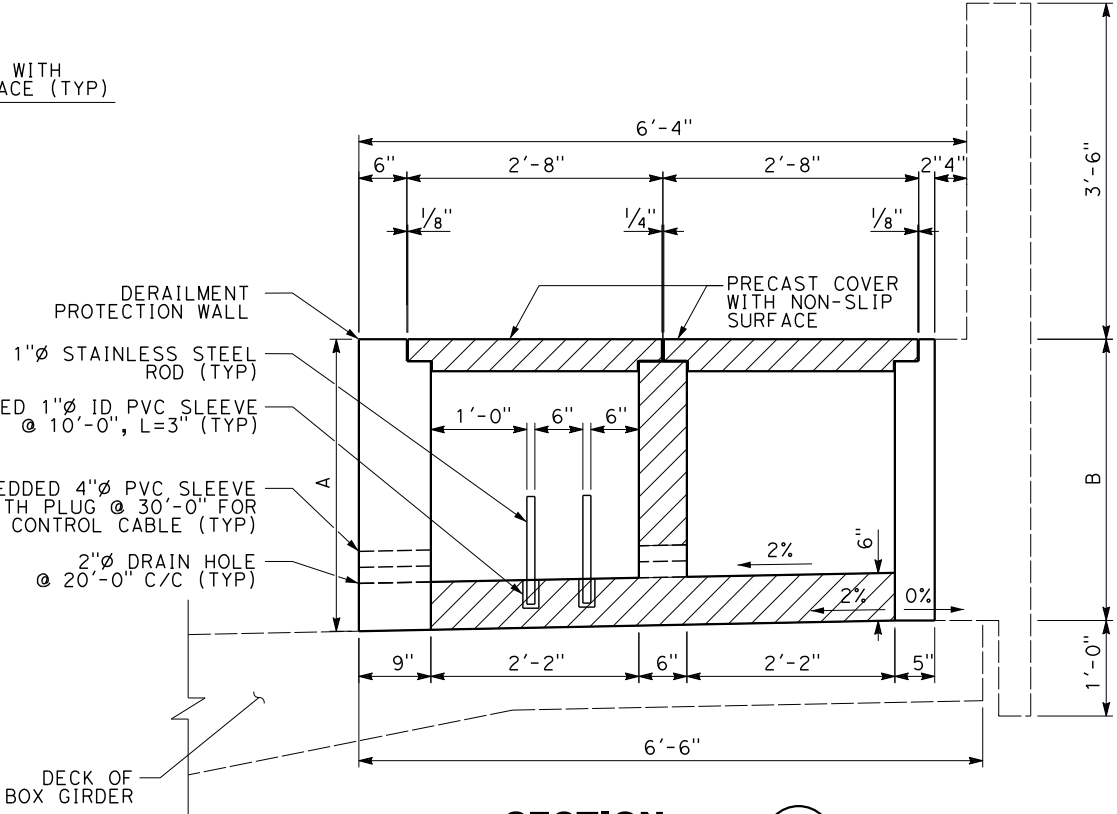
CONTRACT NO.
DRAWING NO. DD-ST-002
SCALE AS SHOWN
SHEET NO.

05/14/2013
HSR 13-06 - EXECUTION VERSION

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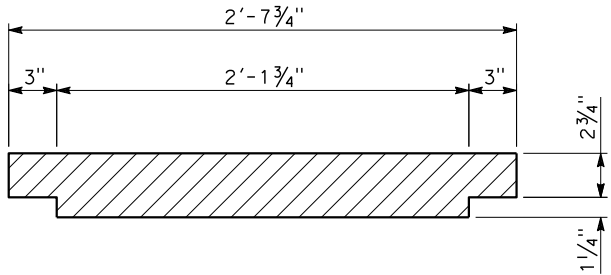


CABLE TROUGH PLAN
SCALE: 1"=1'-0"

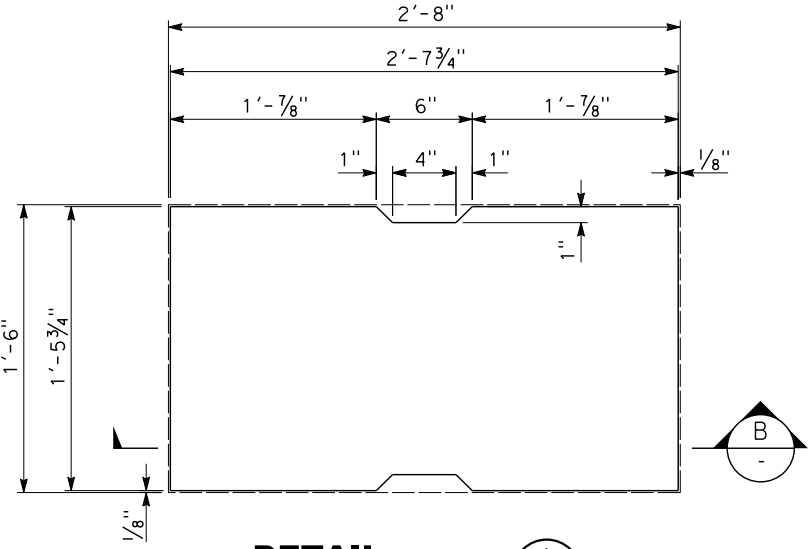


SECTION A-A
SCALE: 1"=1'-0"

	DOUBLE TRACK	SINGLE TRACK
A	3'-1/2"	3'-3 7/16"
B	2'-11 1/8"	3'-2 1/4"



SECTION B-B
SCALE: 1/2"=1'-0"



DETAIL 1
SCALE: 1/2"=1'-0"

- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. THE CABLE TROUGH DETAIL IS FOR STANDARD TWO TRACK. FOR CABLE TROUGH INFORMATION IN SPECIAL TRACK AREA, THE CONTRACTOR SHALL COORDINATE WITH THE INTERFACED TRACK WORK DESIGNER FOR DETAILED INFORMATION.

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DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

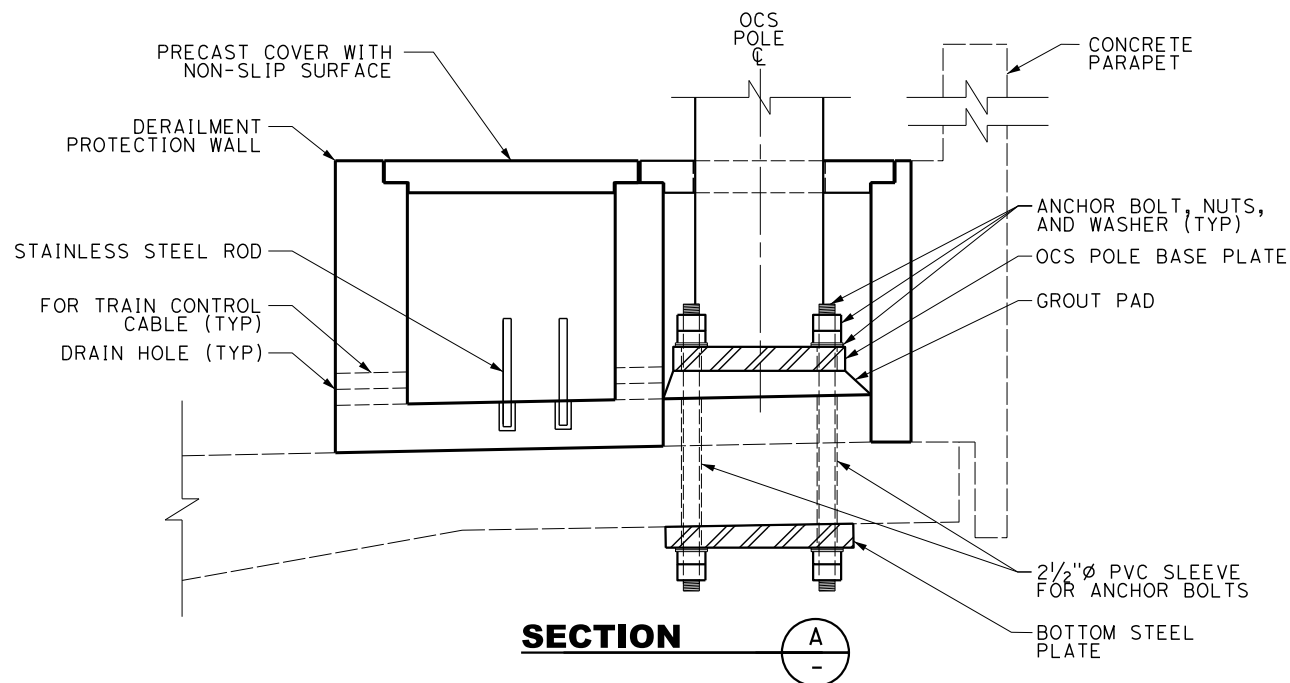
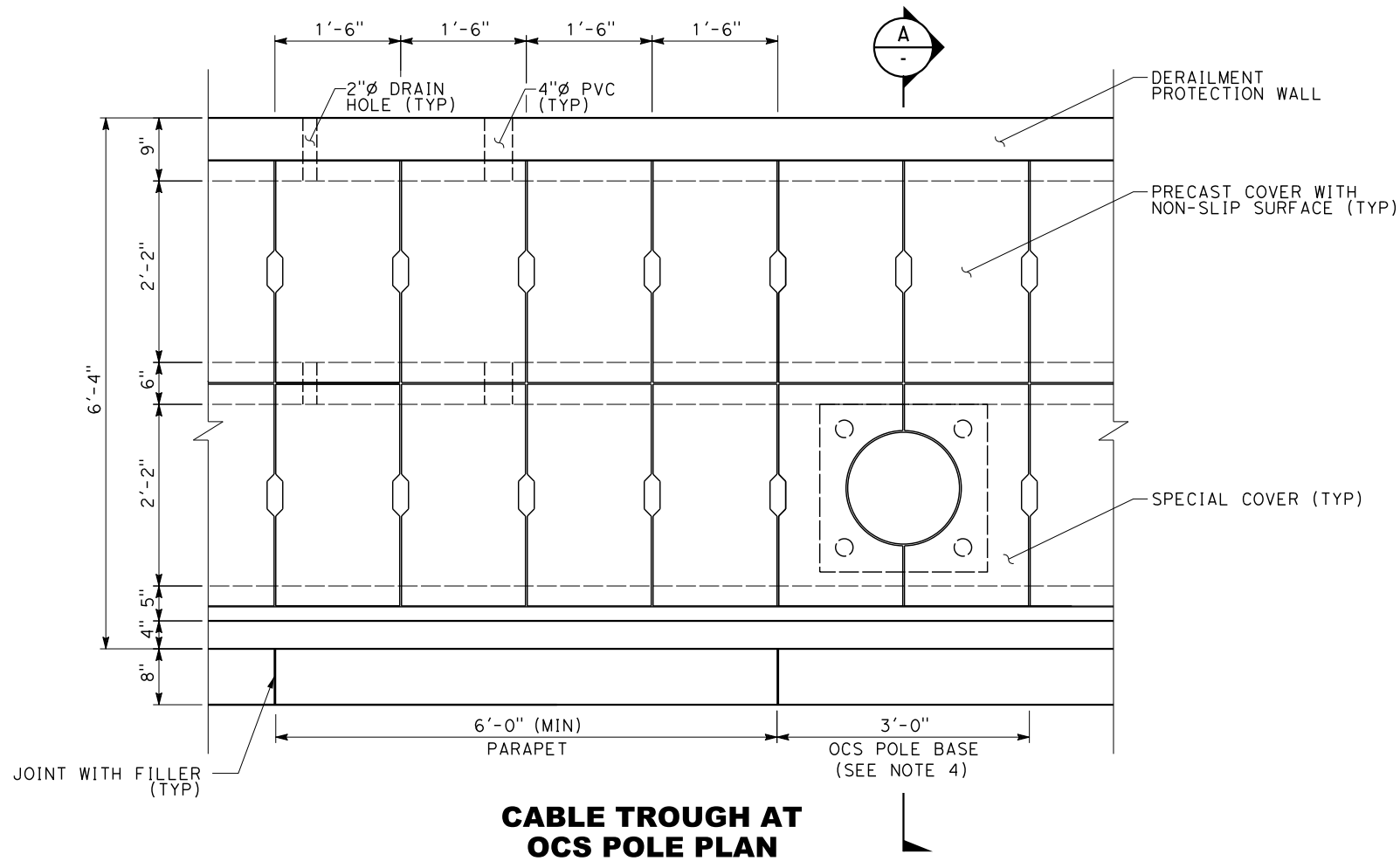
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

AERIAL STRUCTURE
TYPICAL CABLE TROUGH DETAILS

CONTRACT NO.
DRAWING NO. DD-ST-003
SCALE AS SHOWN
SHEET NO.

05/14/2013
HSR 13-06 - EXECUTION VERSION

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. FOR PRECAST COVER DETAIL, SEE DRAWING "AERIAL STRUCTURE TYPICAL CABLE TROUGH DETAILS".
3. SEE STRUCTURAL DRAWING "AERIAL STRUCTURE TYPICAL CABLE TROUGH DETAILS" FOR DIMENSIONS NOT SHOWN.
4. OCS POLE, ANCHOR BOLT ASSEMBLIES, BASE PLATES, AND GROUT PAD FOR OCS POLE FOUNDATION ARE SHOWN FOR ILLUSTRATION ONLY. THE LOCATION OF EMBEDDED PVC SLEEVES AND LOADS FOR DESIGN OF OCS POLE FOUNDATION SHALL CONFORM TO THE REQUIREMENTS IN THE STRUCTURAL CHAPTER OF THE DESIGN CRITERIA.



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DATE 07/12/2013

**PARSONS
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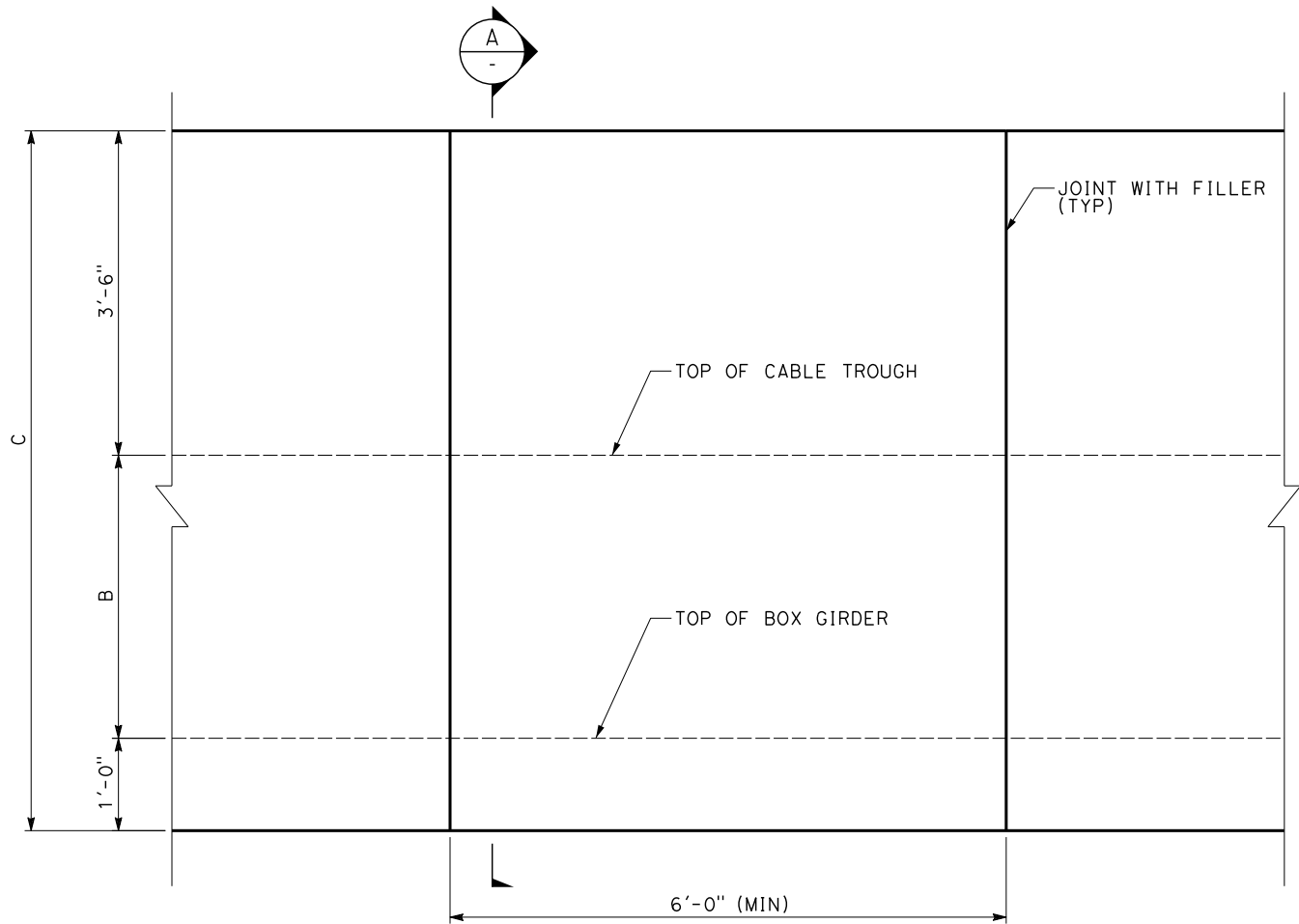
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

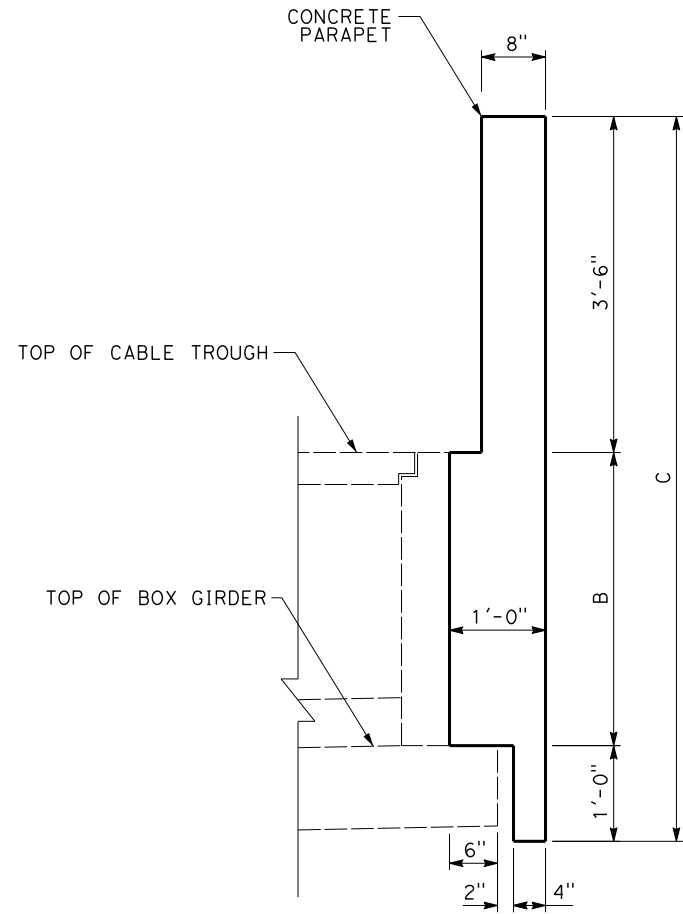
AERIAL STRUCTURE
CABLE TROUGH DETAILS
AT OCS POLE

CONTRACT NO.
DRAWING NO. DD-ST-004
SCALE AS SHOWN
SHEET NO.

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CONCRETE PARAPET
ELEVATION VIEW



SECTION A
-

	DOUBLE TRACK	SINGLE TRACK
B	2'-11 1/8"	3'-2 1/4"
C	7'-5 5/8"	7'-8 1/4"

NOTES:

1. PARAPETS SHALL BE PROVIDED ALONG EDGES OF AERIAL STRUCTURES, BRIDGES, AND HST GRADE SEPARATIONS.
2. PARAPETS SHALL BE DESIGNED FOR WIND LOADS, SLIPSTREAM EFFECTS, AND OTHER LOADS REQUIRED IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
3. PARAPETS SHALL BE DESIGNED TO ACCOMMODATE FUTURE INSTALLATION OF SOUND WALLS.
4. AT CONSTRUCTION JOINTS OF CONCRETE PARAPETS, A JOINT WITH FILLER SHALL BE PROVIDED. IN ADDITION, A PARAPET EXPANSION JOINT SHALL BE DESIGNED AND PROVIDED AT EVERY AERIAL STRUCTURE AND BRIDGE EXPANSION JOINT LOCATION. THE INSIDE FACE OF JOINT OPENING SHALL BE COVERED WITH A GALVANIZED STEEL PLATE SECURELY FASTENED TO THE INSIDE FACE OF THE PARAPET ON ONE SIDE OF THE EXPANSION JOINT WITH A LENGTH OF THREE INCHES MORE THAN THE MAXIMUM JOINT MOVEMENT LENGTH.



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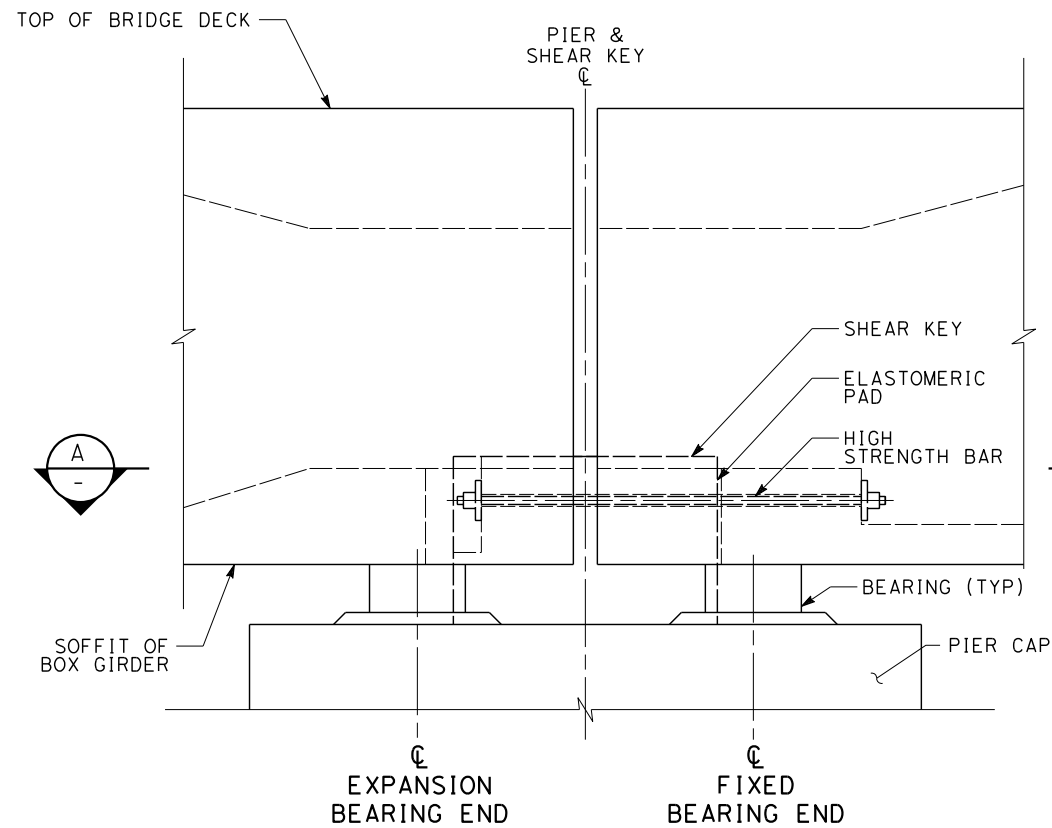
DESIGNED BY P. LIN
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CHECKED BY K. PUGASAP
IN CHARGE J. CHIRCO
DATE 07/12/2013



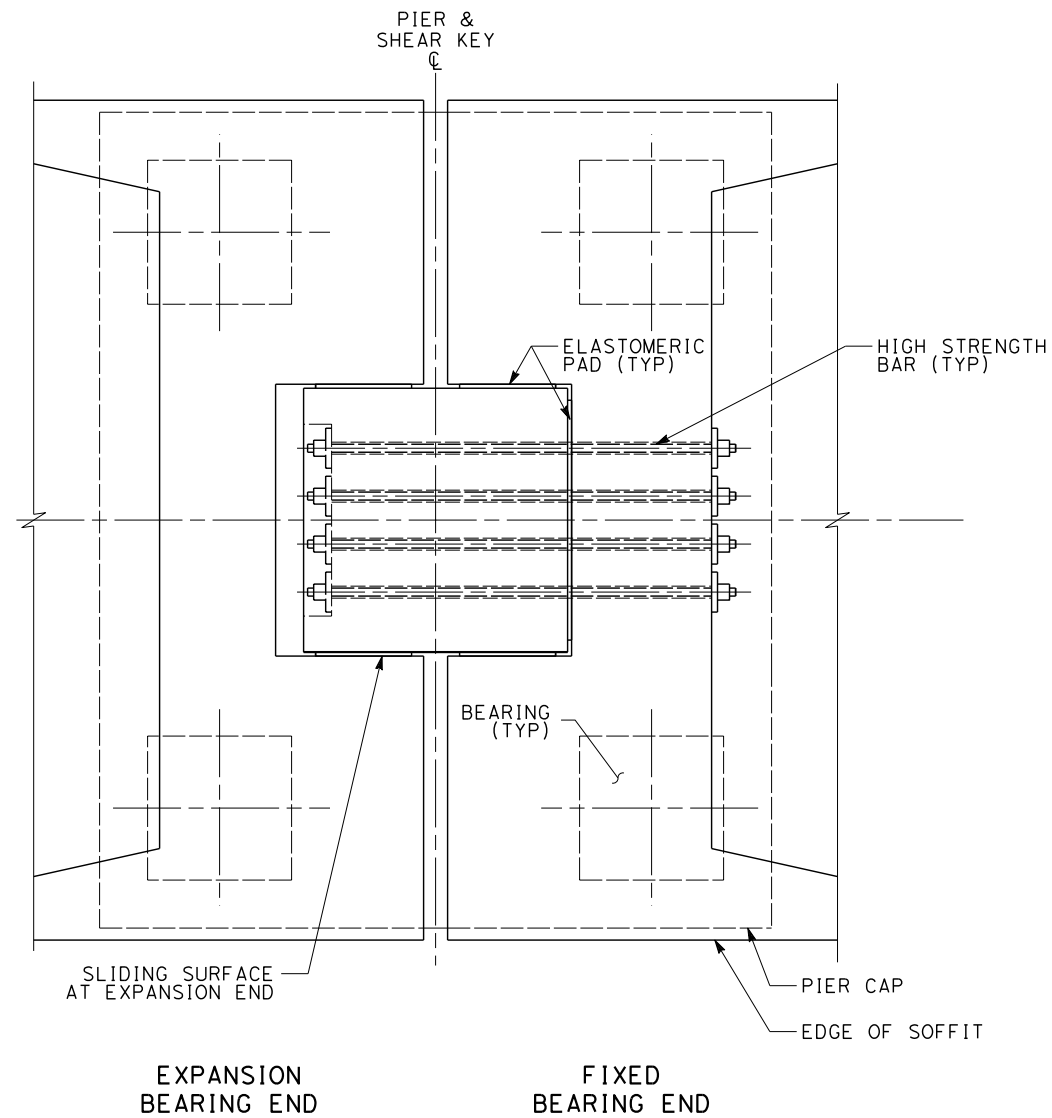
CALIFORNIA HIGH-SPEED TRAIN PROJECT STRUCTURAL DIRECTIVE
AERIAL STRUCTURE CONCRETE PARAPET

CONTRACT NO.
DRAWING NO. DD-ST-005
SCALE AS SHOWN
SHEET NO.

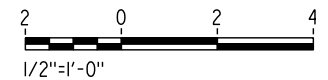
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ELEVATION
CONCRETE PARAPET NOT SHOWN



SECTION
1/2" = 1'-0"



NOTES:

1. THE SHEAR KEY DETAILS SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL DEVELOP A SHEAR KEY SYSTEM THAT CONFORMS TO THE REQUIREMENTS IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
2. BEARINGS SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND MAINTENANCE. BEARINGS SHALL BE ADJUSTABLE AND REPLACEABLE AT ANYTIME DURING THE LIFE OF STRUCTURES WITHOUT INTERFERENCE TO NORMAL TRAIN OPERATIONS.
3. THE PROCEDURES FOR BEARING REPLACEMENT, INCLUDING THE LOCATIONS OF JACKS AND THE ALLOWED JACKING FORCES SHALL BE SPECIFIED ON THE DRAWINGS.

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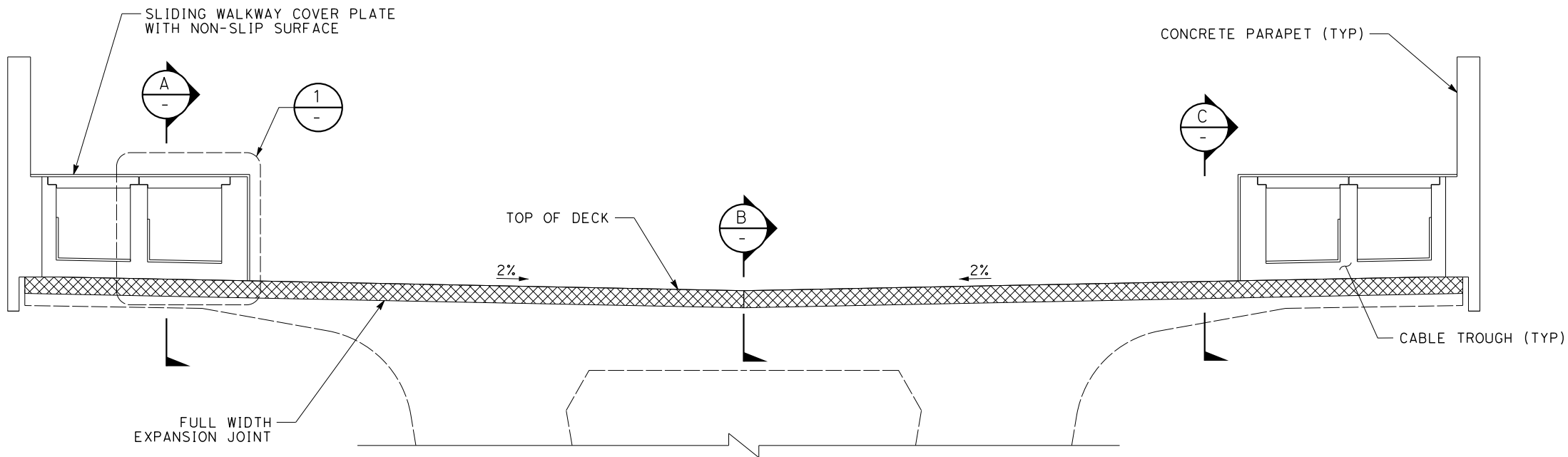
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

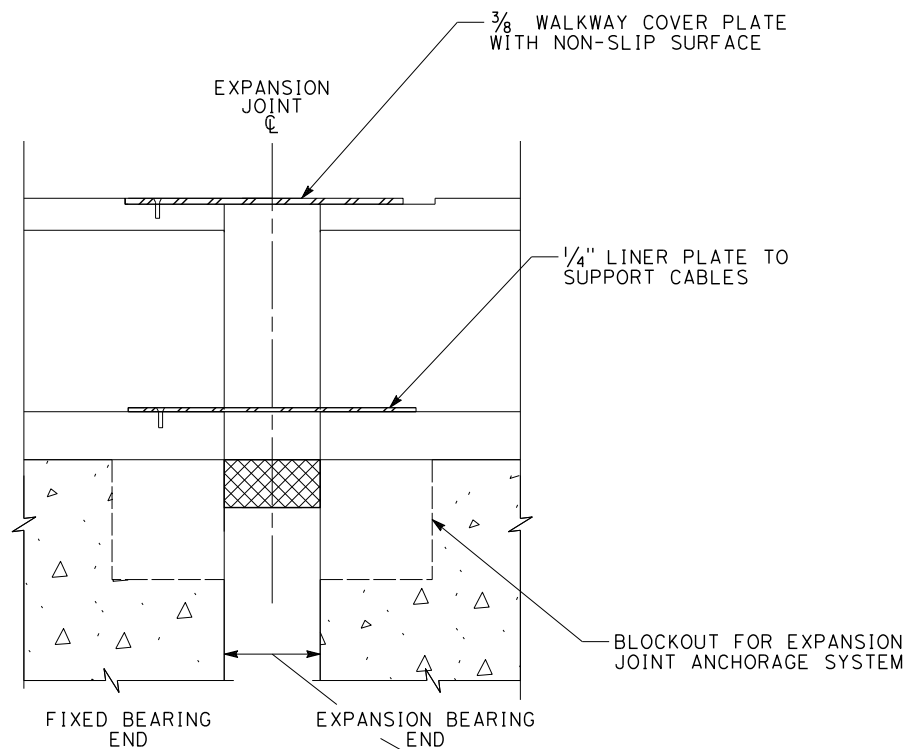
AERIAL STRUCTURE
TYPICAL SPAN
SHEAR KEY DETAILS

CONTRACT NO.
DRAWING NO. DD-ST-006
SCALE AS SHOWN
SHEET NO.

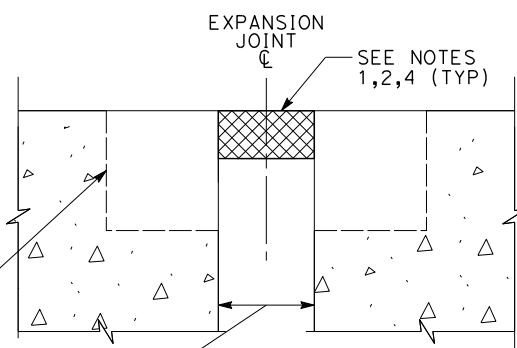
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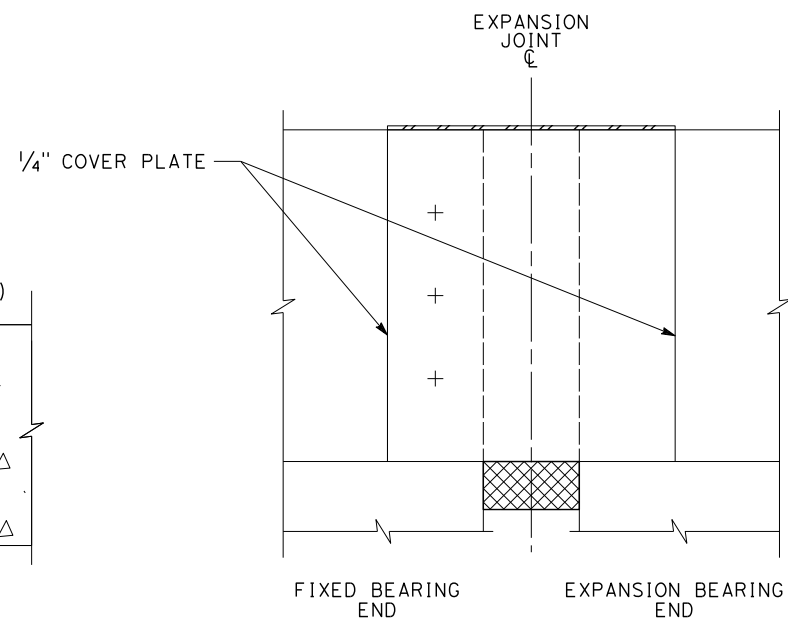
EXPANSION JOINT SECTION



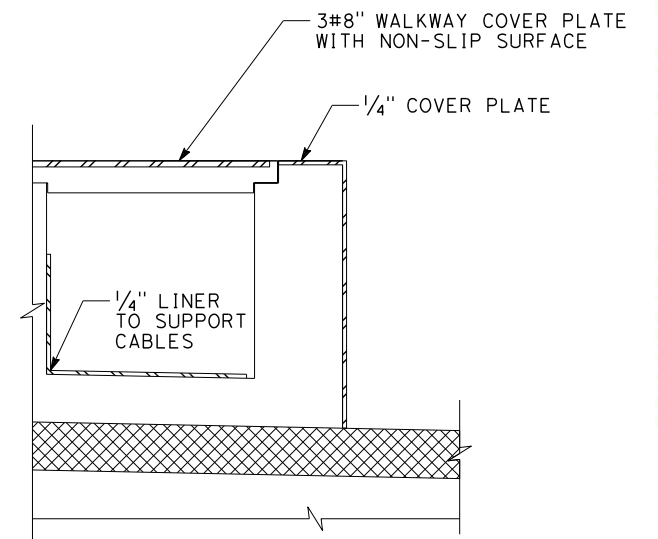
SECTION A



SECTION B



SECTION C



DETAIL 1

NOTES:

1. THE EXPANSION JOINT DETAILS SHOWN ARE FOR ILLUSTRATION ONLY. THE CONTRACTOR SHALL DEVELOP AN EXPANSION JOINT SYSTEM THAT CONFORMS TO THE REQUIREMENTS IN THE STRUCTURES CHAPTER OF THE DESIGN CRITERIA.
2. THE EXPANSION OPENING BETWEEN THE ENDS OF BRIDGE DECK AND ABUTMENT SHALL ACCOMMODATE THE MOVEMENT RANGE AS SPECIFIED.
3. EXPANSION JOINTS SHALL BE EASILY ACCESSIBLE FOR INSPECTION AND MAINTENANCE. EXPANSION JOINTS SHALL BE REPLACEABLE AT ANYTIME DURING THE LIFE OF STRUCTURES WITHOUT INTERFERENCE TO NORMAL TRAIN OPERATIONS.
4. THE EXPANSION JOINT SHALL BE WATERTIGHT.
5. ALL STRUCTURAL STEEL PLATES SHALL BE GALVANIZED.

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PARSONS
BRINCKERHOFF



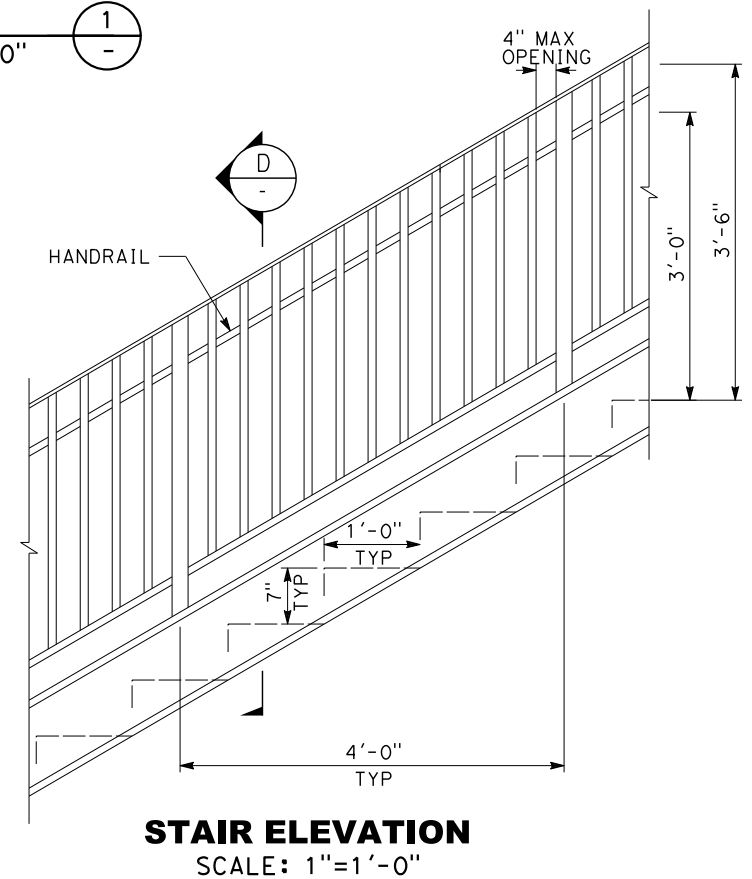
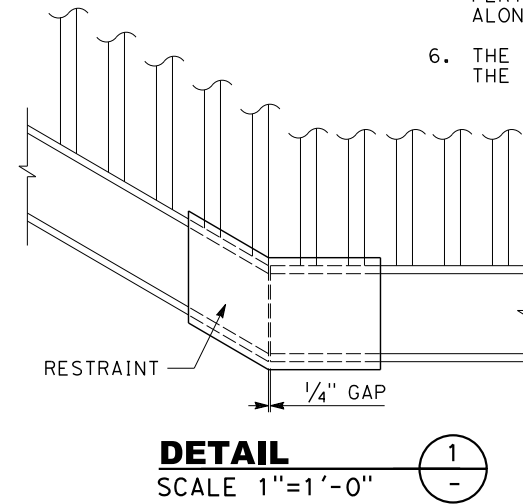
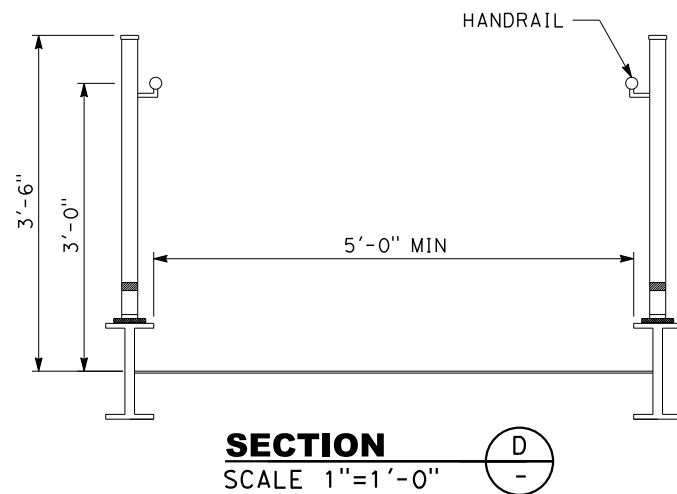
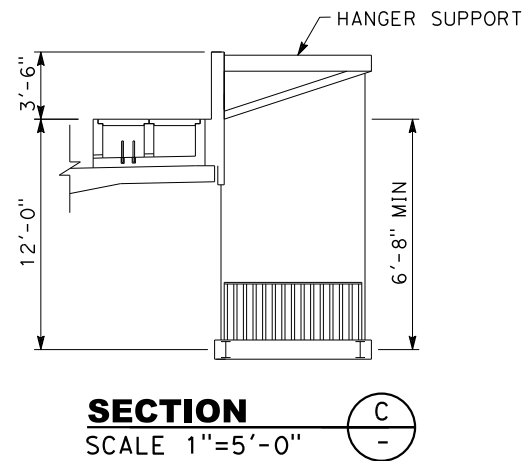
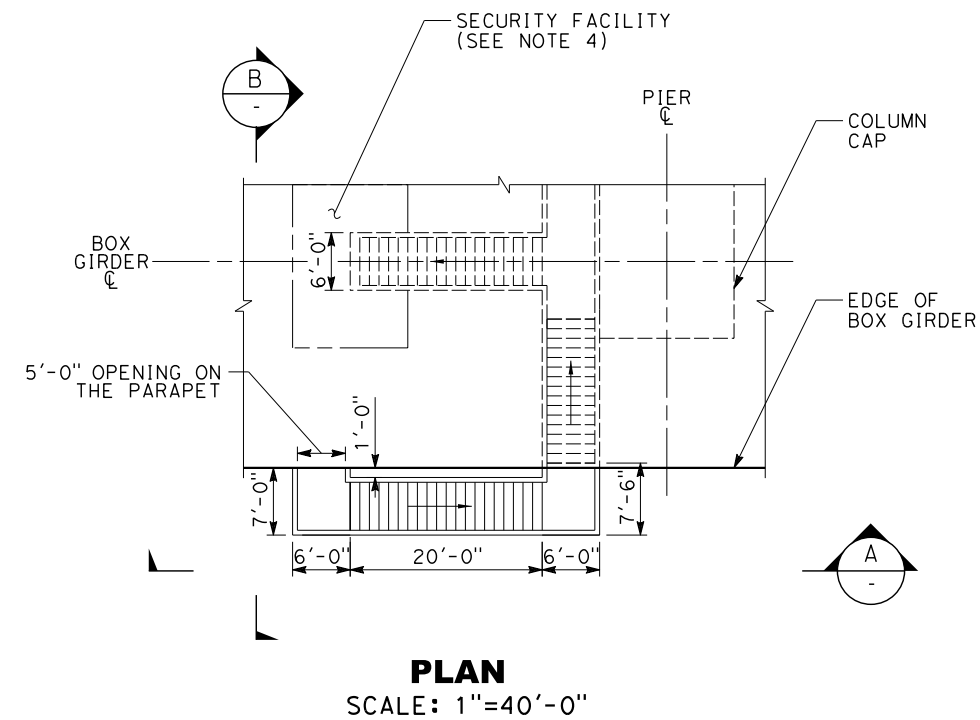
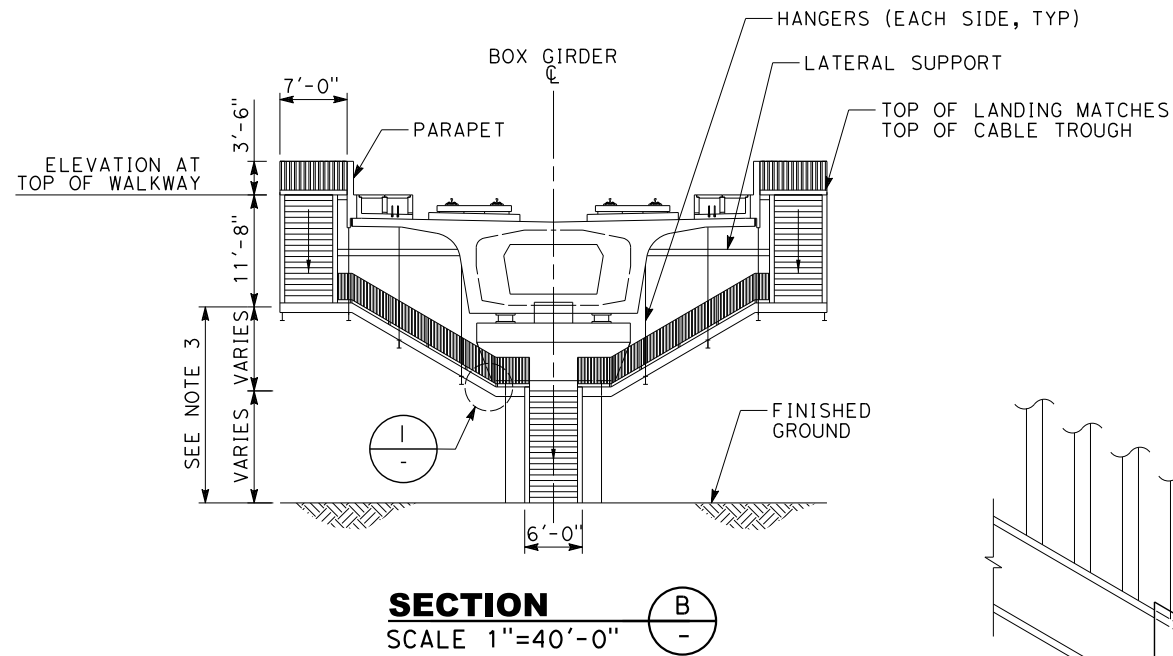
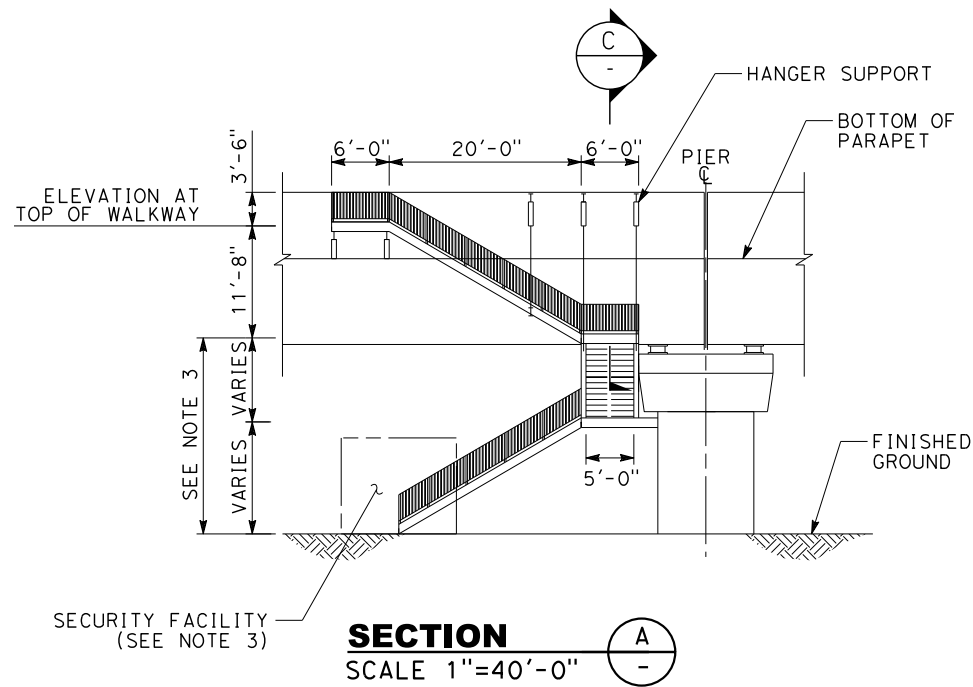
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE

AERIAL STRUCTURE
TYPICAL SPAN
EXPANSION JOINT DETAILS

CONTRACT NO.
DRAWING NO. DD-ST-007
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE STAIRWAY STRUCTURAL SYSTEM SHOWN IS FOR ILLUSTRATION ONLY. THE CONTRACTOR MAY DESIGN AN EQUIVALENT STAIRWAY SYSTEM TO FIT THE SITE CONDITION.
3. WHERE VERTICAL DISTANCE BETWEEN LANDING EXCEEDS 12'-0", INTERMEDIATE LANDINGS MUST BE PROVIDED.
4. THE SECURITY FACILITY SHALL HAVE SOLID WALLS AND A ROOF (AT LEAST 10 FEET HIGH) WITH A GATE AT FINISHED GROUND ELEVATION.
5. THE ACCESS ROAD FROM THE GATE OF SECURITY FACILITY TO THE LOCAL ROAD SHALL BE PROVIDED. THE CONTRACTOR SHALL COORDINATE WITH THE PERTINENT AUTHORITIES FOR REQUIRED EASEMENT ALONG THE AERIAL STRUCTURES.
6. THE CONTRACTOR SHALL CONSIDER THE LOADS DUE TO THE STAIRWAY IN THE DESIGN OF AERIAL STRUCTURES.

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DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

AERIAL STRUCTURE
EMERGENCY EXIT STAIRWAY DETAILS 1

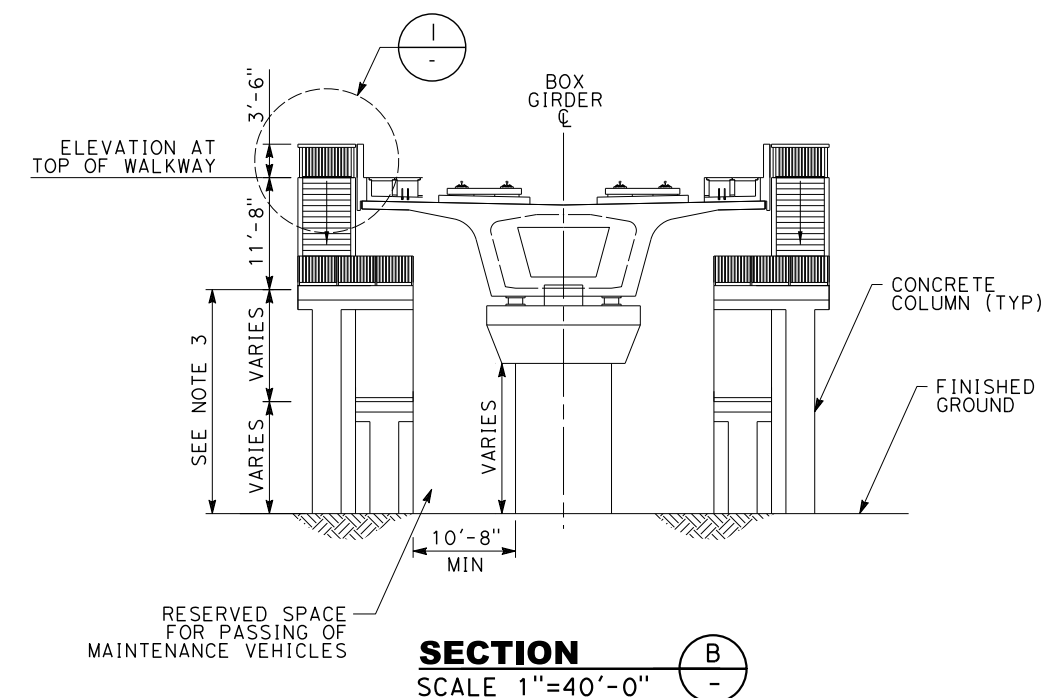
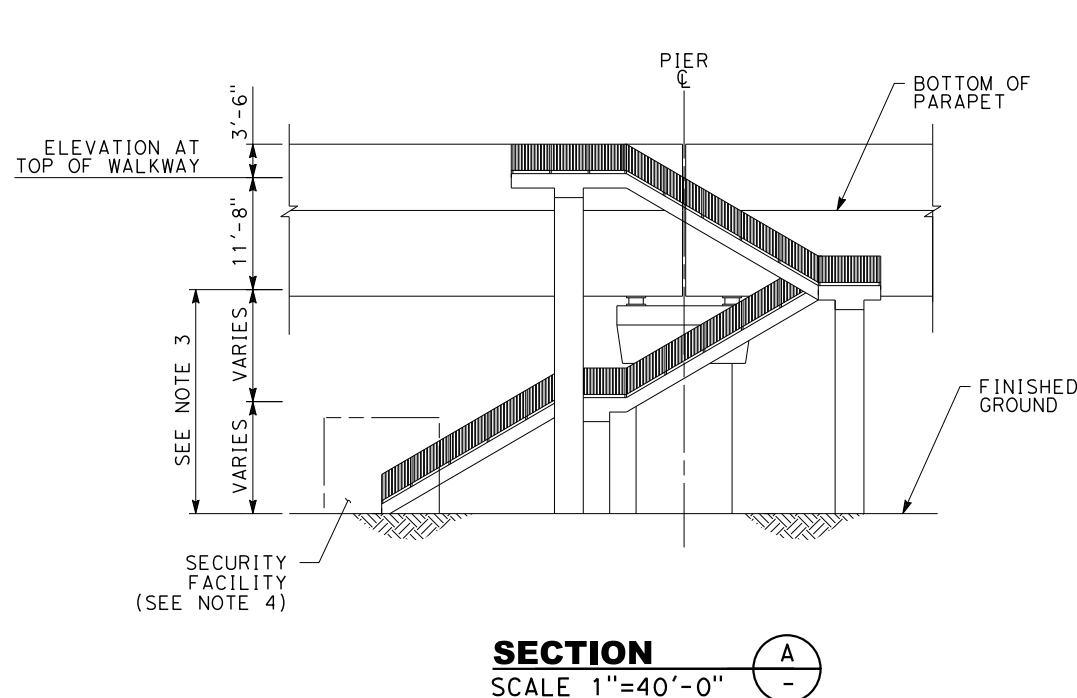
CONTRACT NO.
DRAWING NO. DD-ST-008
SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

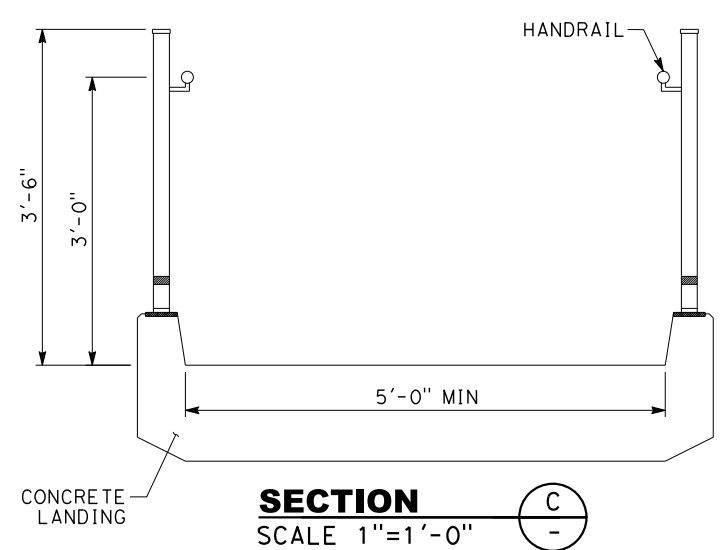
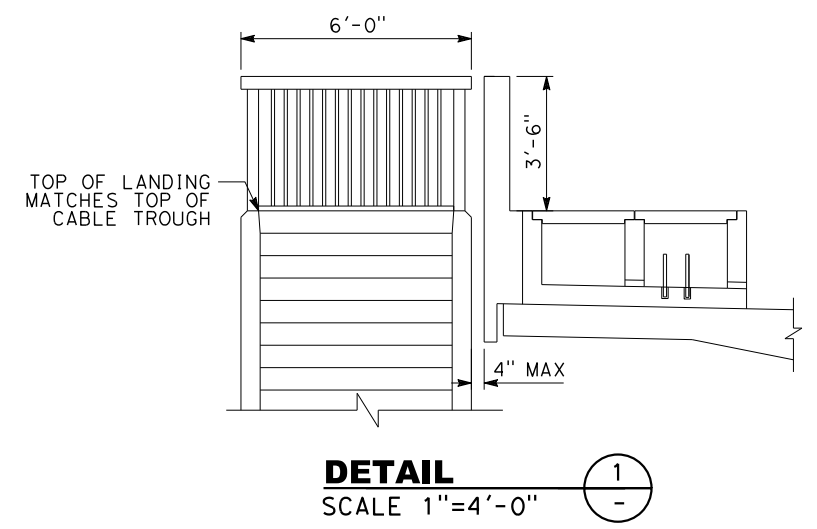
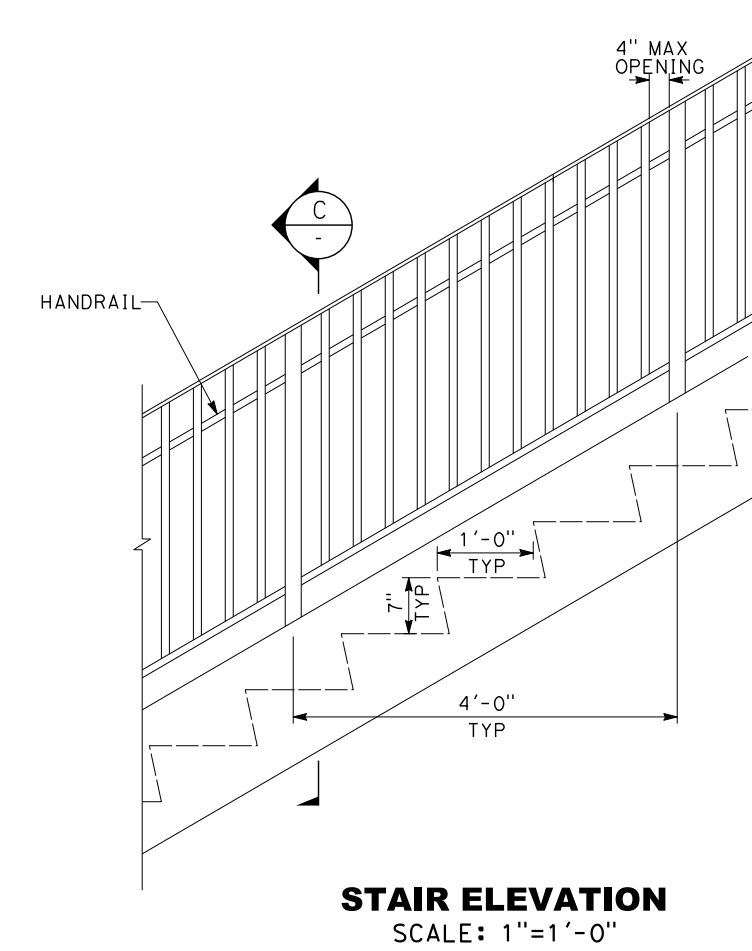
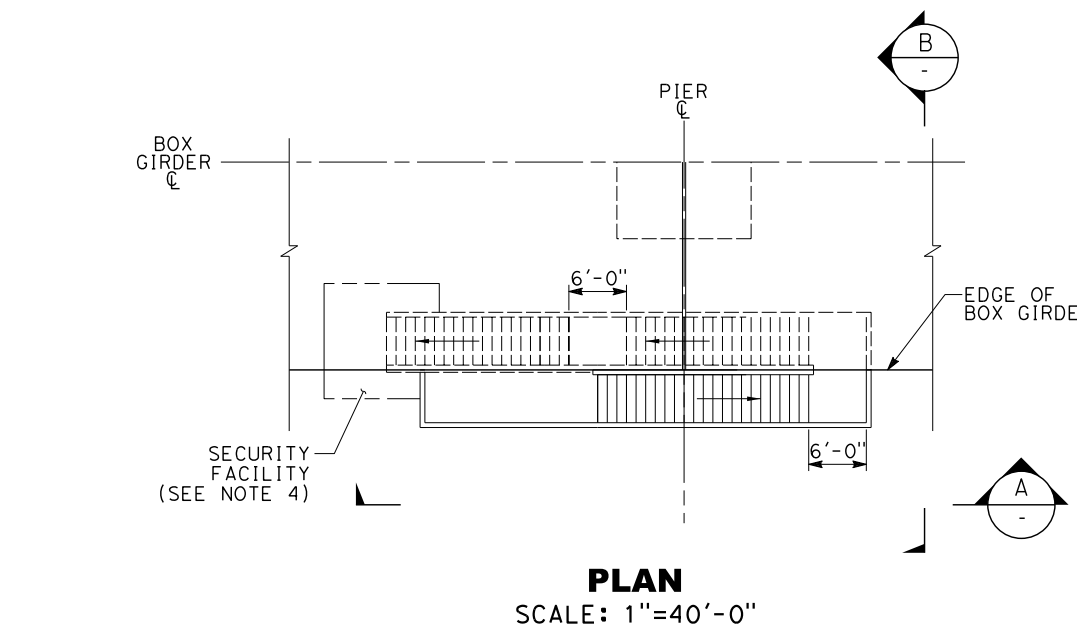
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Huante



- NOTES:**
1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. THE STAIRWAY STRUCTURAL SYSTEM SHOWN IS FOR ILLUSTRATION ONLY. THE CONTRACTOR MAY DESIGN AN EQUIVALENT STAIRWAY SYSTEM TO FIT THE SITE CONDITION.
 3. WHERE VERTICAL DISTANCE BETWEEN LANDING EXCEEDS 12'-0", INTERMEDIATE LANDINGS SHALL BE PROVIDED.
 4. THE SECURITY FACILITY SHALL HAVE SOLID WALLS AND A ROOF (AT LEAST 10 FEET HIGH) WITH A GATE AT FINISHED GROUND ELEVATION.
 5. THE ACCESS ROAD FROM THE GATE OF SECURITY FACILITY TO THE LOCAL ROAD SHALL BE PROVIDED. THE CONTRACTOR SHALL COORDINATE WITH THE PERTINENT AUTHORITIES FOR REQUIRED EASEMENT ALONG THE AERIAL STRUCTURES.
 6. THE CONTRACTOR SHALL CONSIDER THE LOADS DUE TO THE STAIRWAY IN THE DESIGN OF AERIAL STRUCTURES.



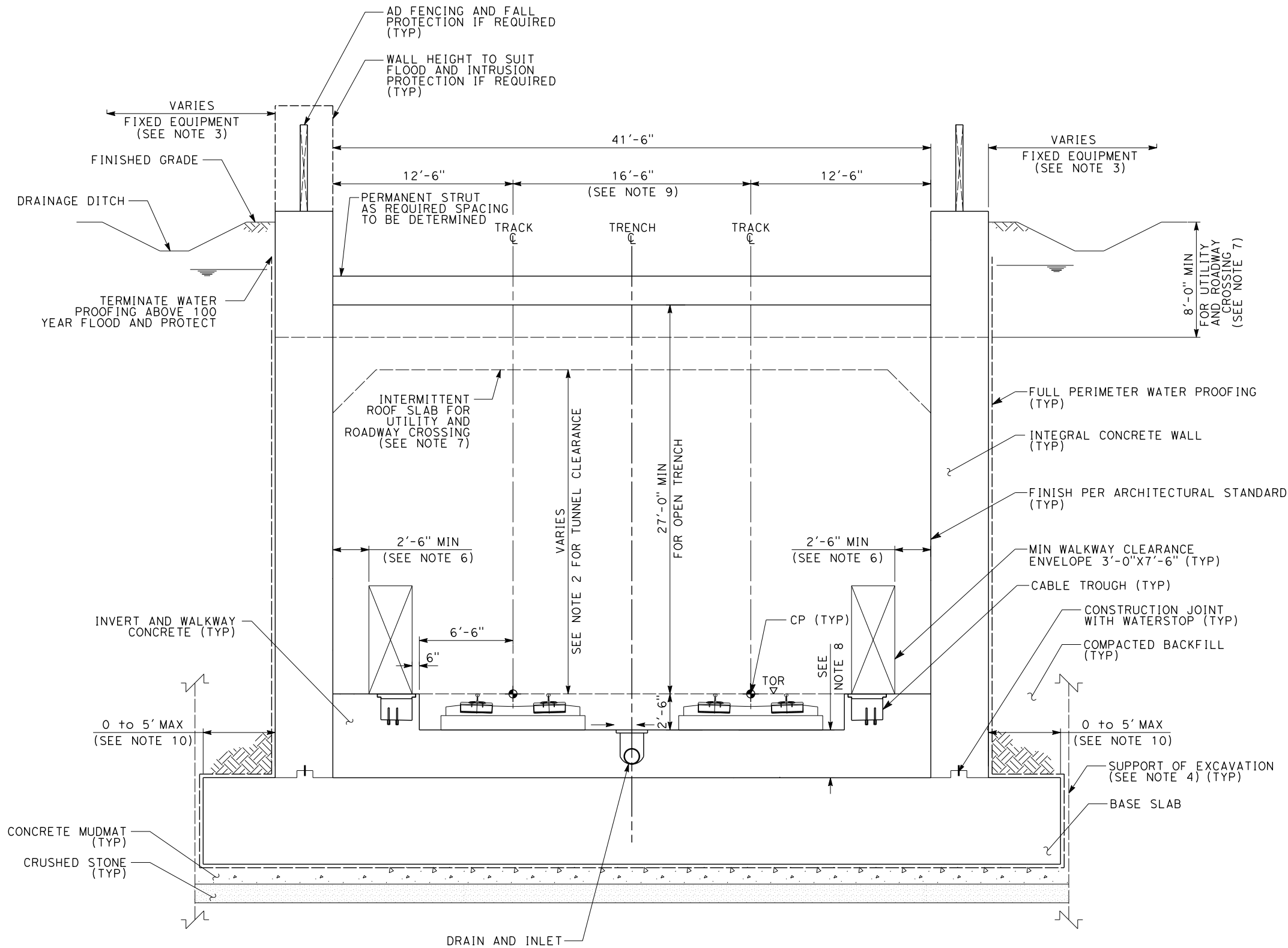
						DESIGNED BY P. LIN					CALIFORNIA HIGH-SPEED TRAIN PROJECT STRUCTURAL DIRECTIVE		CONTRACT NO.	
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						CHECKED BY K. PUGASAP							SCALE AS SHOWN	
						IN CHARGE J. CHIRCO							SHEET NO.	
REV	DATE	BY	CHK	APP	DESCRIPTION	DATE 07/12/2013								
A	05/31/13				EXECUTION VERSION									

05/14/2013
HSR 13-06 - EXECUTION VERSION

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Huante



NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. A 27'-0" MIN VERTICAL CLEARANCE SHALL BE MAINTAINED IN TUNNELS AS WELL AS THE MINIMUM TUNNEL CROSS-SECTIONAL AREA REQUIRED AS PER THE TUNNELS CHAPTER OF THE DESIGN CRITERIA.
3. TYPES, LOCATIONS AND DIMENSIONS OF NICHES AND/OR ENLARGEMENTS FOR EMERGENCY VENTILATION, IF REQUIRED, NOT DESIGNED.
4. TYPES, LOCATIONS AND DIMENSIONS OF TEMPORARY SUPPORT AND/OR GROUND TREATMENT NOT SHOWN.
5. STRUCTURAL COMPONENTS ARE NOT DESIGNED.
6. PROVIDE A MIN OF 2'-6" AS AN ALLOWANCE FOR FIXED EQUIPMENT.
7. FOR UTILITY AND ROADWAY CROSSINGS, INTERMITTENT ROOF SLAB SHALL BE PROVIDED AND BACKFILLED TO SUIT.
8. DEPTH TO BE DETERMINED BASED ON DRAINAGE DESIGN.
9. DIMENSION SHOWN BASED ON TANGENT TRACK. INCREASE WIDTH AS REQUIRED FOR CURVATURE.
10. WIDTH AS REQUIRED FOR RESISTANCE TO UPLIFT.



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY R. VALENTI
DRAWN BY V. HUANTE
CHECKED BY P. LIN
IN CHARGE J. CHIRCO
DATE 07/12/2013

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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

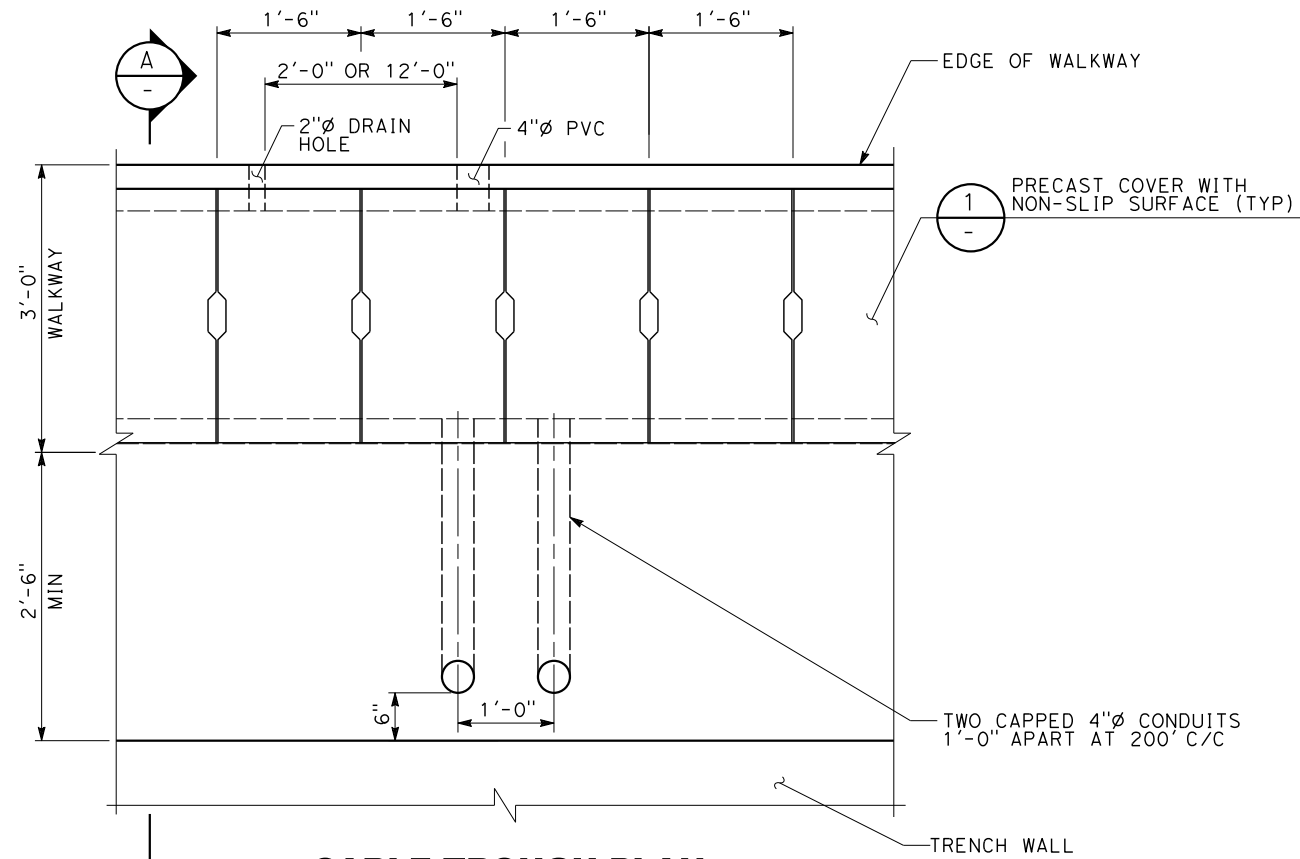
CALIFORNIA HIGH-SPEED TRAIN PROJECT STRUCTURAL DIRECTIVE

TYPICAL CROSS SECTION
TWO TRACK TRENCH
OUTSIDE WALKWAY

CONTRACT NO.
DRAWING NO. DD-ST-010
SCALE AS SHOWN
SHEET NO.

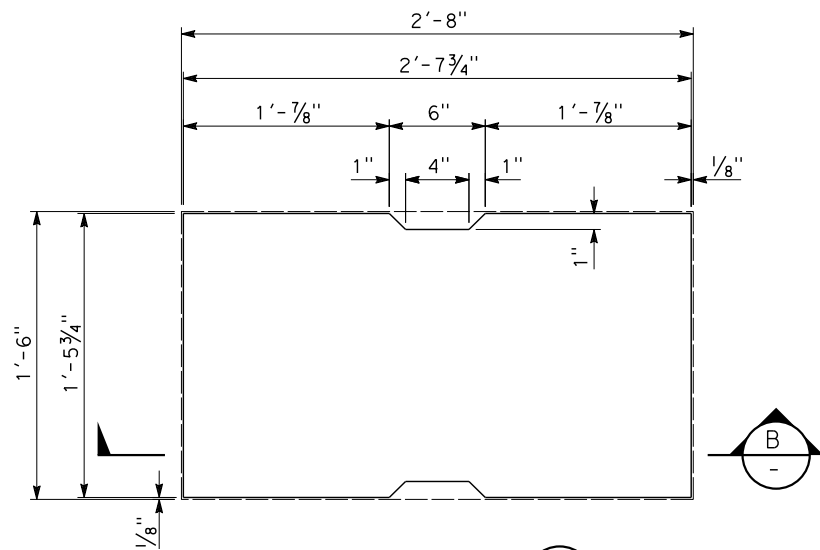
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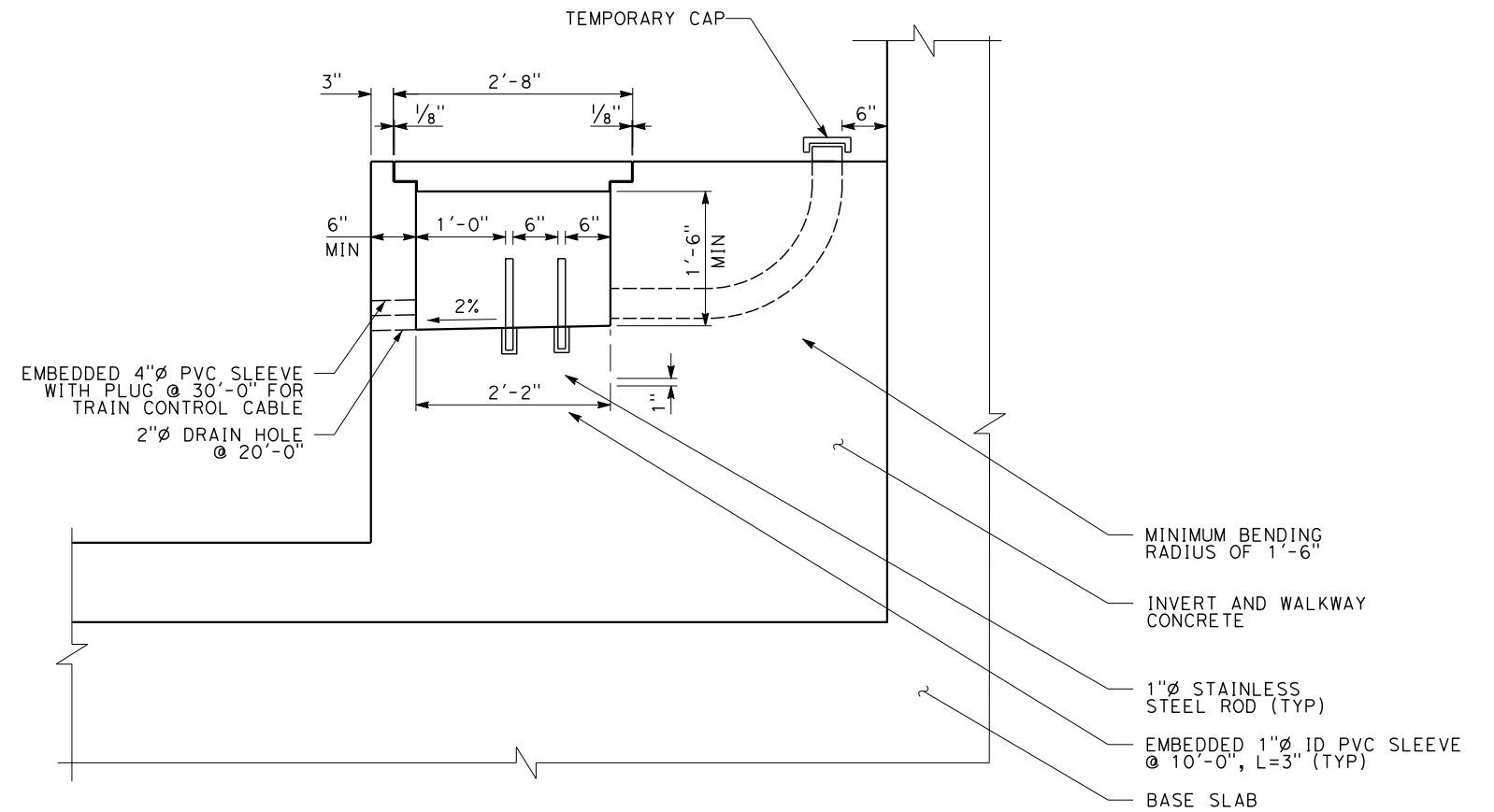
CABLE TROUGH PLAN AND CONDUIT DETAIL

SCALE: 1"=1'-0"



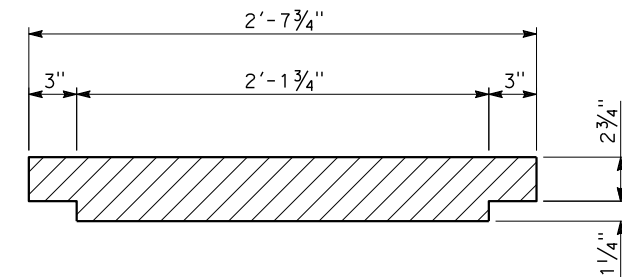
DETAIL

SCALE: 1/2"=1'-0"



SECTION

SCALE: 1"=1'-0"



SECTION

SCALE: 1/2"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY B. VALENTI
DRAWN BY V. HUANTE
CHECKED BY P. LIN
IN CHARGE J. CHIRCO
DATE 07/12/2013

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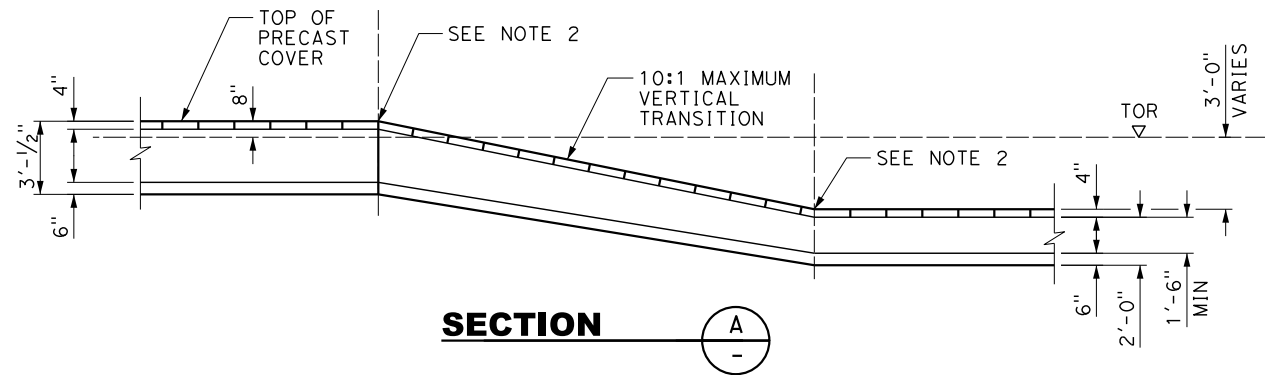
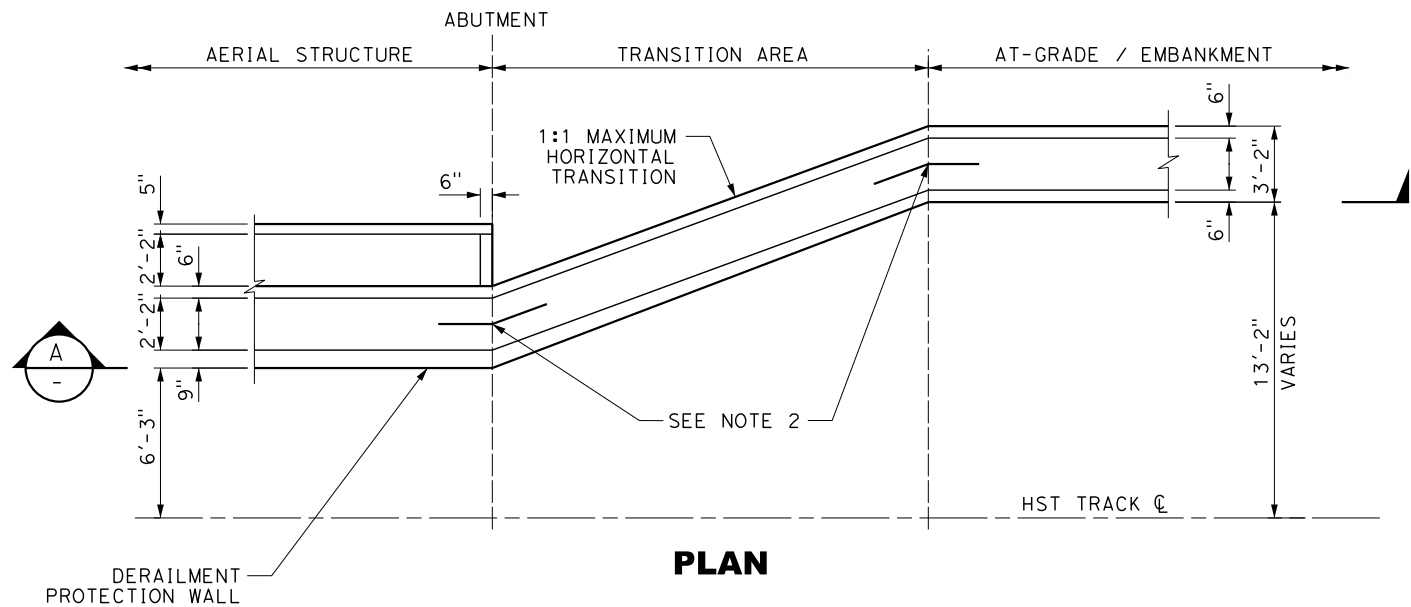
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

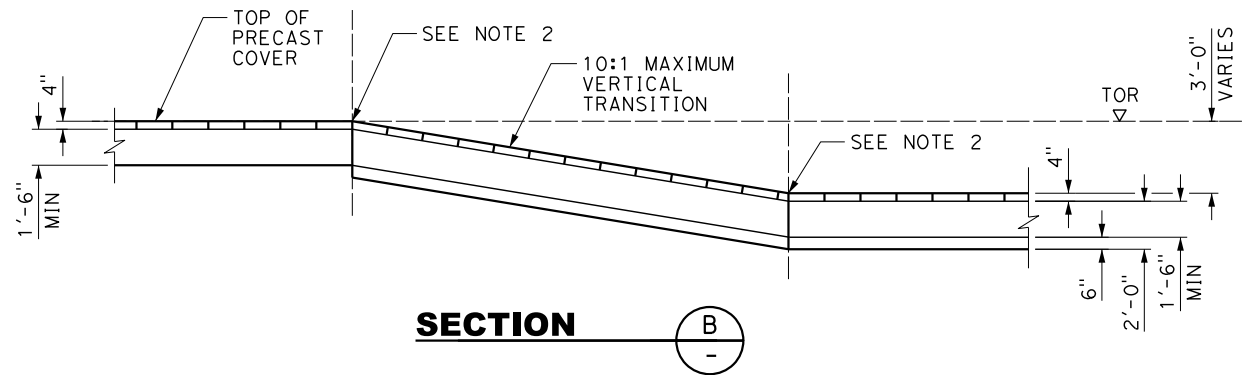
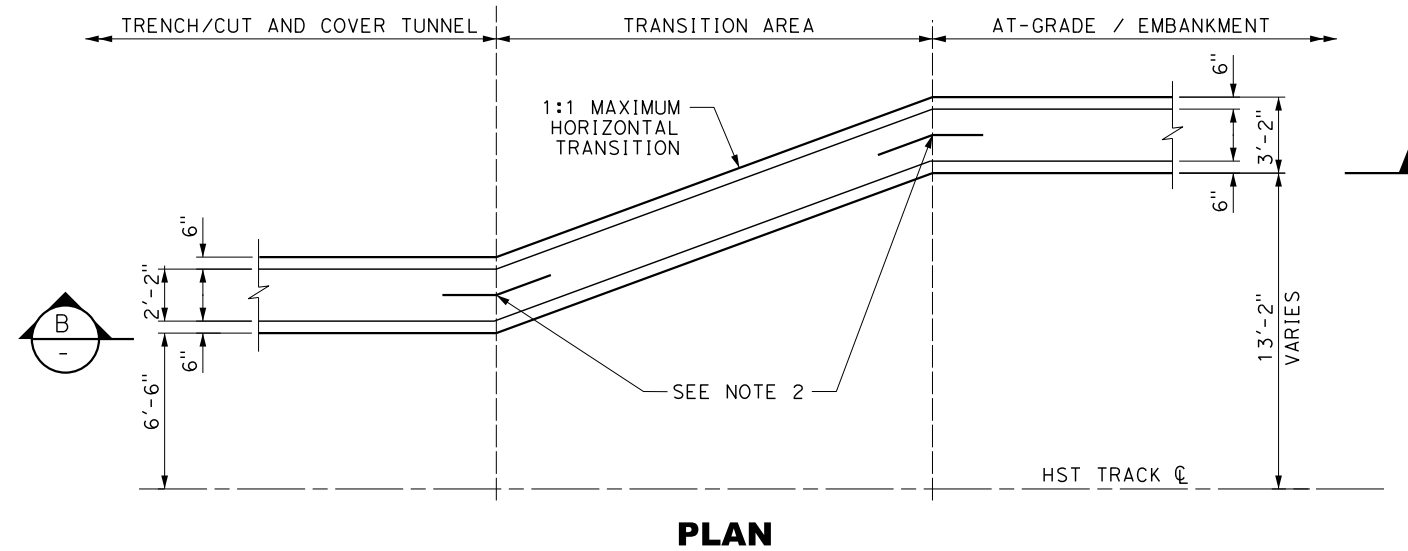
CABLE TROUGH DETAILS
TRENCH/CUT AND COVER TUNNEL

CONTRACT NO.
DRAWING NO. DD-ST-011
SCALE AS SHOWN
SHEET NO.

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AERIAL STRUCTURE TO AT-GRADE/EMBANKMENT



TRENCH/CUT AND COVER TUNNEL TO AT-GRADE/EMBANKMENT

NOTES:

- BOTH HORIZONTAL AND VERTICAL TRANSITION OF THE CABLE TROUGH SHALL OCCUR WITHIN THE LONGITUDINAL STRUCTURAL TRANSITION ZONE.
- SPECIAL TRANSITION TROUGH AND COVER WILL BE REQUIRED AT ANGLE POINTS. MAXIMIZE EXTENT OF STANDARD PIECES.



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DESIGNED BY P. LIN
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DATE 07/12/2013

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HIGH-SPEED RAIL AUTHORITY

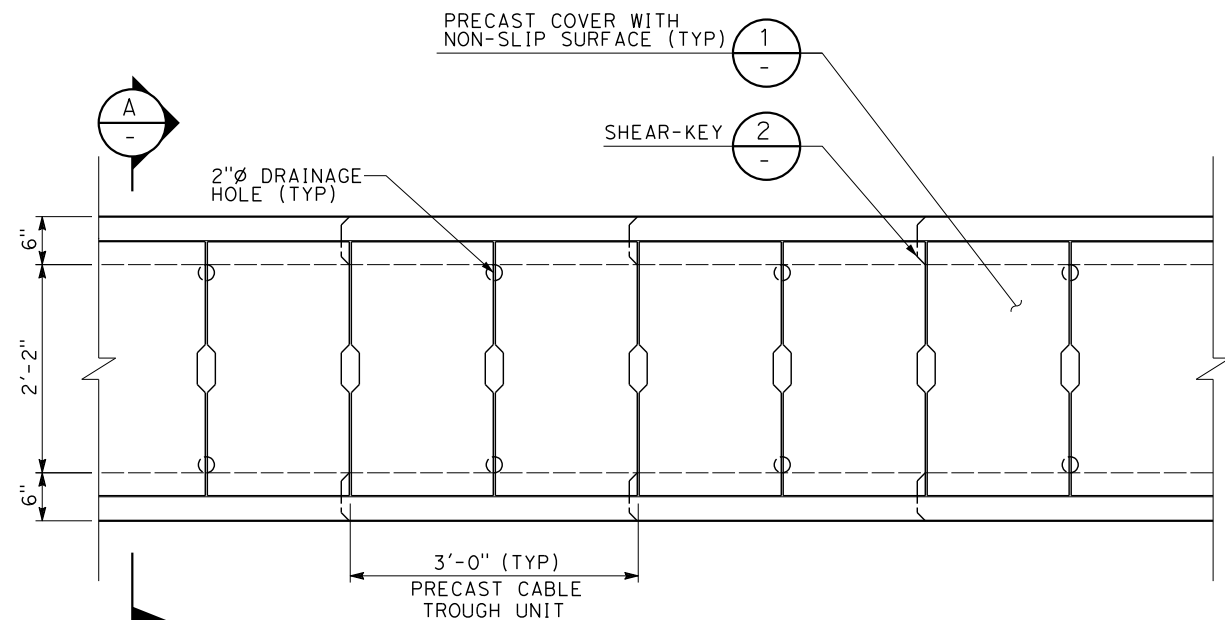
**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

CABLE TROUGH LAYOUT TRANSITION AREAS

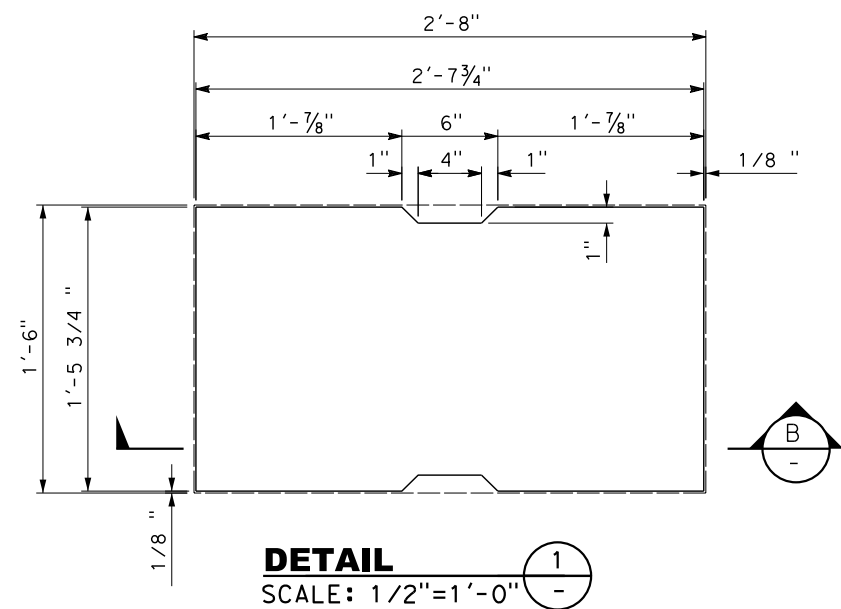
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DRAWING NO. DD-ST-012
SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

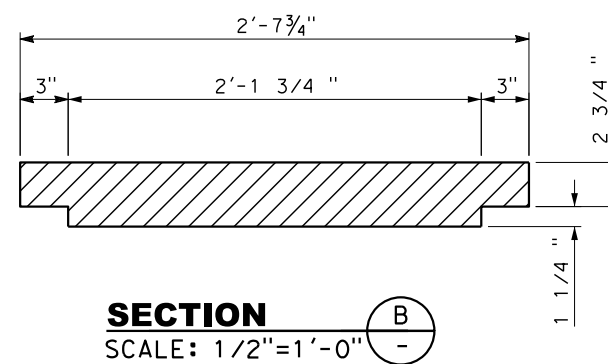
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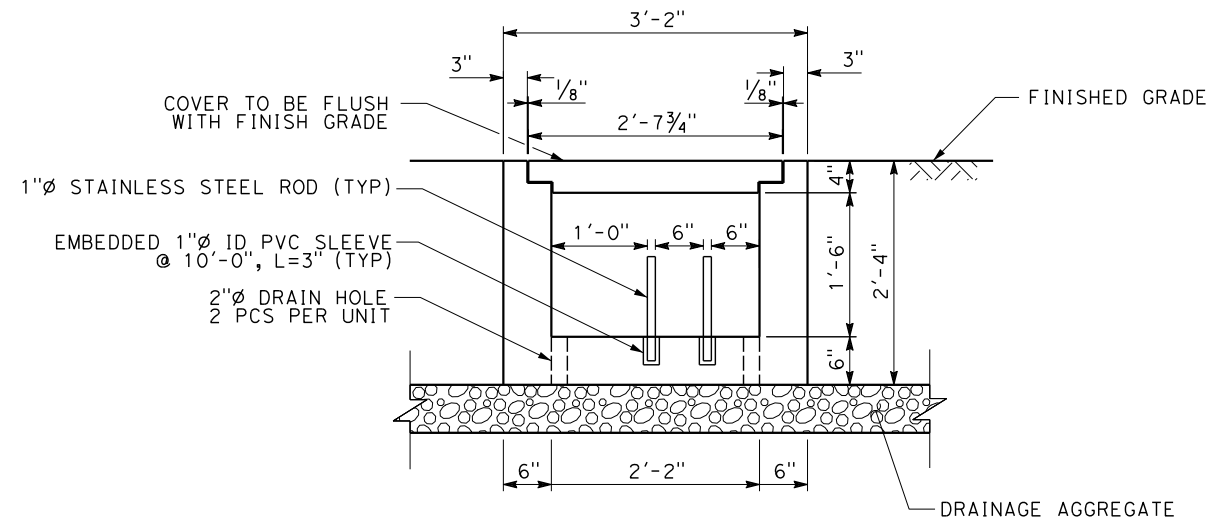
PRECAST CABLE TROUGH PLAN
SCALE: 1"=1'-0"



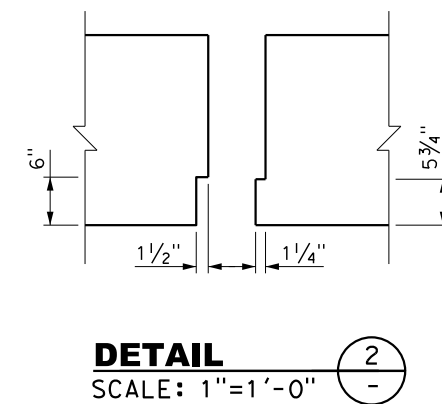
DETAIL 1
SCALE: 1/2"=1'-0"



SECTION B
SCALE: 1/2"=1'-0"



SECTION A
SCALE: 1"=1'-0"



DETAIL 2
SCALE: 1"=1'-0"

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY B. VALENTI
DRAWN BY T. DOUNG
CHECKED BY P. LIN
IN CHARGE J. CHIRCO
DATE 07/12/2013

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HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
STRUCTURAL DIRECTIVE**

TYPICAL CABLE TROUGH DETAILS
EMBANKMENT/CUT

CONTRACT NO.
DRAWING NO. DD-ST-013
SCALE AS SHOWN
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION



1. ELEVATION OF TOP OF WALL AND BOTTOM OF FOOTING SHALL BE AS SHOWN ON OTHER CONTRACT DRAWINGS, VALUES OF H ARE DESIGN HEIGHTS ONLY.
2. WALL OFFSET SHALL BE DETERMINED BY THE PROJECT STRUCTURAL ENGINEER IN CONSULTATION WITH THE PROJECT GEOTECHNICAL ENGINEER BASED ON THE CONSTRUCTION METHOD AND SEQUENCING AND IN ACCORDANCE WITH PROJECT DESIGN CRITERIA.

DESIGNED BY	B. VALENTI
DRAWN BY	V. HUANTE
CHECKED BY	P. LIN
IN CHARGE	J. CHIRCO
DATE	07/12/2013

CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

RETAINING WALL LAYOUT AND DETAILS

SHEET NO.

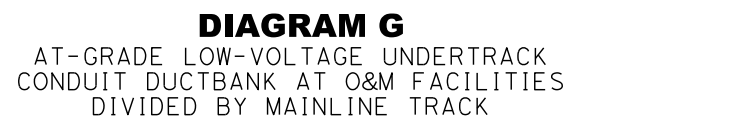
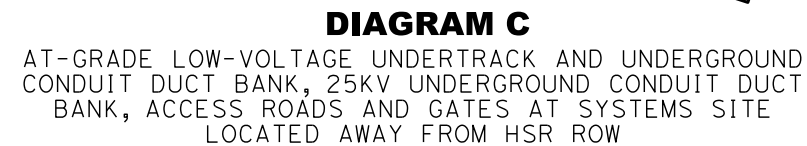
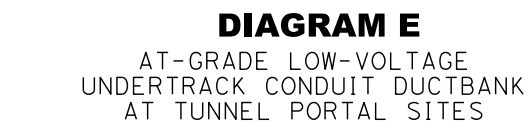
California High-Speed Train Project



Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Systems



DESIGNED BY	B. BANKS
DRAWN BY	V. HUANTE
CHECKED BY	C. DALOIA
IN CHARGE	R. SCHEDES
DATE	07/12/2013



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

TYPICAL CIVIL ACCOMMODATIONS FOR SYSTEMS AT SYSTEM SITES, STATIONS, TUNNEL PORTAL FACILITIES AND O&M FACILITIES

CONTRACT NO.
DRAWING NO. DD-SY-010
SCALE NO SCALE
SHEET NO.

California High-Speed Train Project



Request for Proposal for Design-Build Services

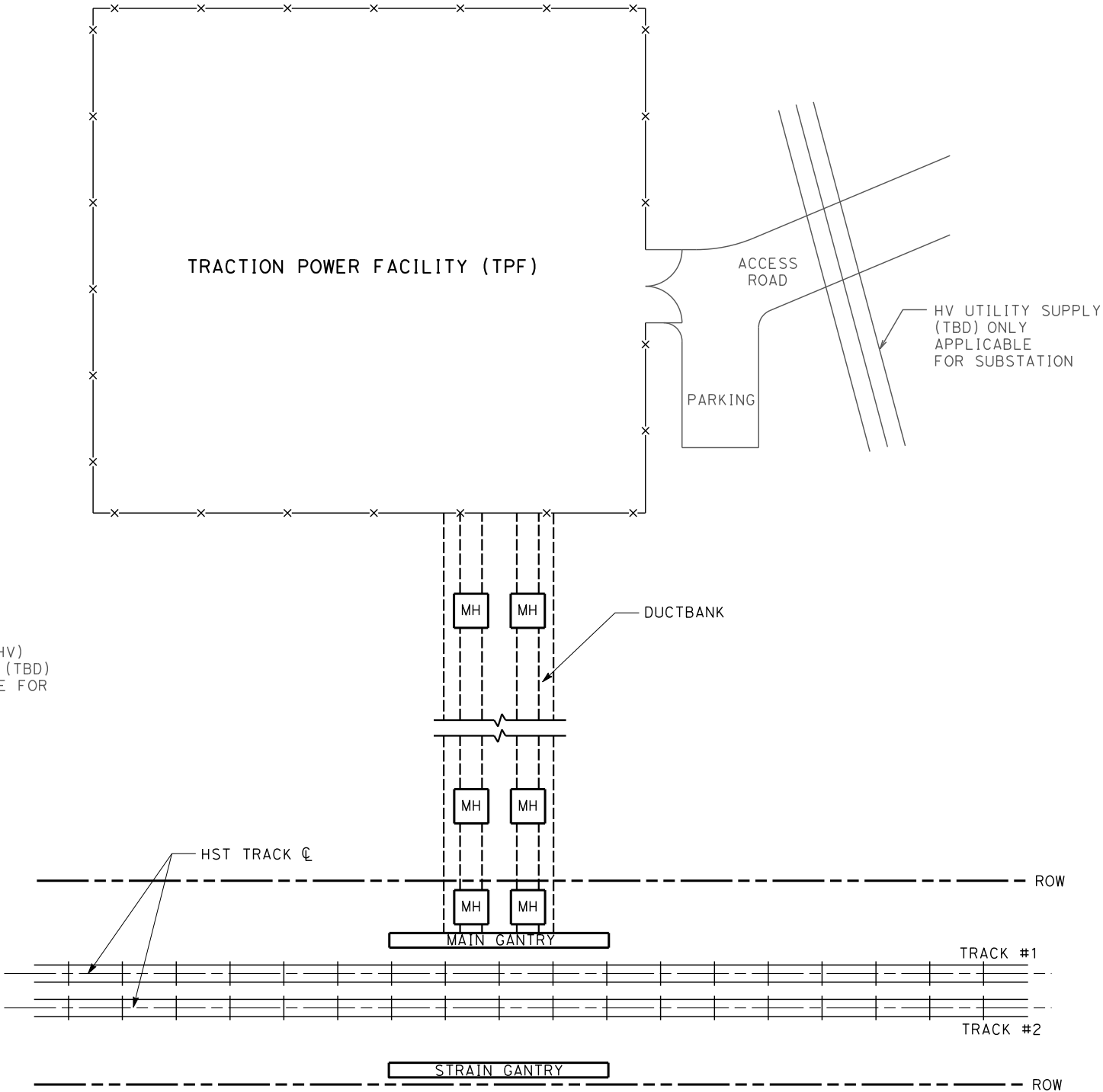
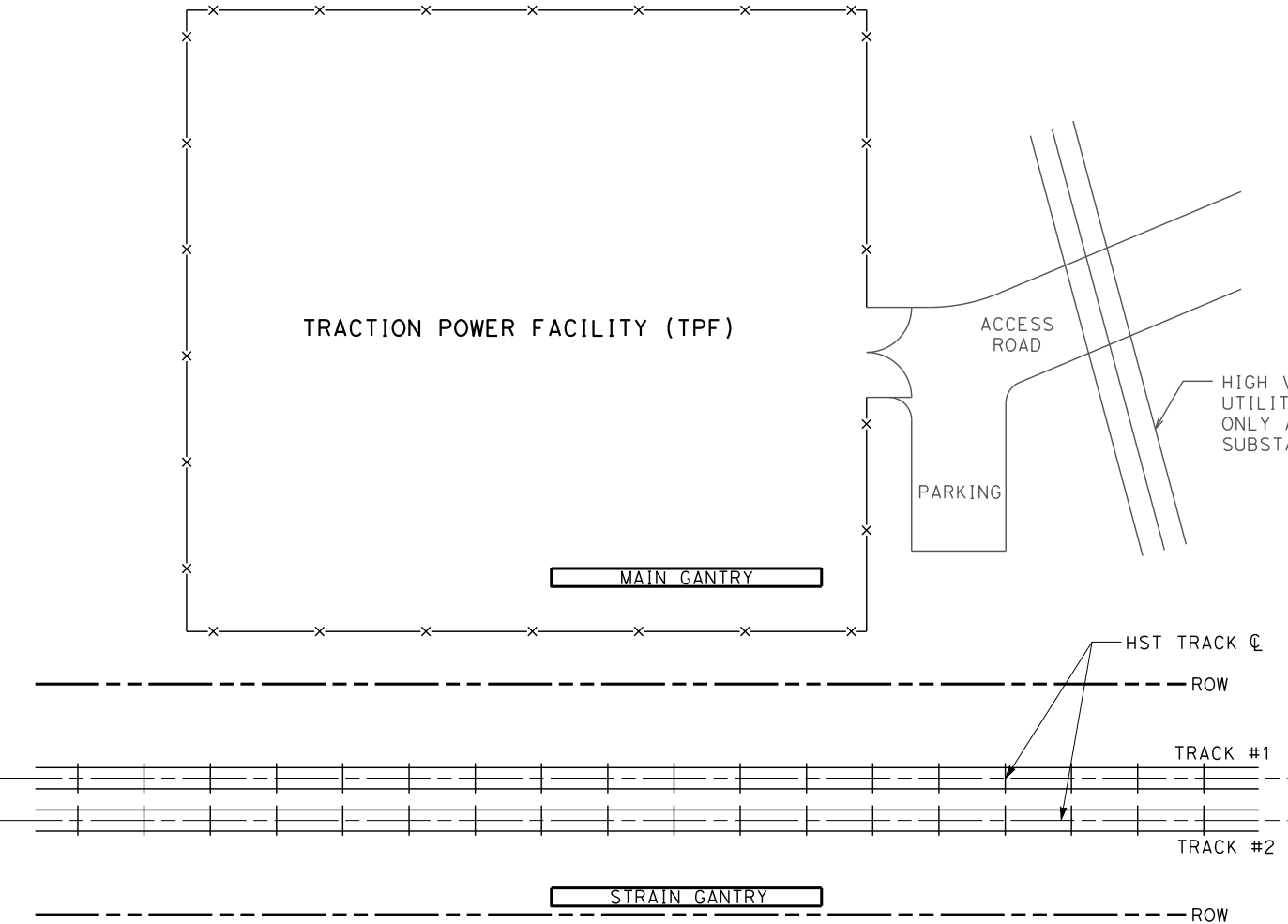
RFP No.: HSR 11-16
Directive Drawings

Traction Power

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NOTES:

1. THIS DRAWING SHOWS GANTRY ARRANGEMENT FOR AT-GRADE CONFIGURATION FOR TWO ALTERNATIVE OPTIONS:
- 1) TPF LOCATED ADJACENT TO TRACK ALIGNMENT;
2) TPF LOCATED AWAY FROM TRACK ALIGNMENT;
ALTERNATIVE 1 IS THE PREFERRED OPTION. ALTERNATIVE 2 MAY BE USED IF ADEQUATE LAND IS NOT AVAILABLE ADJACENT TO RAILROAD ROW.
2. ALTERNATIVE 2 SHALL BE USED FOR TRACK ALIGNMENT ON AERIAL STRUCTURES. SEE "TYPICAL DOUBLE CATENARY FEEDING GANTRY ARRANGEMENT ON AERIAL STRUCTURE" DRAWING.
3. THE SPACING AND NUMBER OF MANHOLES IS INDICATIVE ONLY. ACTUAL LAYOUT WILL DEPEND UPON THE SITE CONDITIONS.
4. THE MAIN GANTRY AND THE STRAIN GANTRY SHALL BE TYPICALLY 4' WIDE AND 40' HIGH.
5. SEE "TYPICAL SINGLE CATENARY FEEDING GANTRY ARRANGEMENT" AND "TYPICAL DOUBLE CATENARY FEEDING GANTRY ARRANGEMENT" DIRECTIVE DRAWINGS FOR GANTRY LOCATION DETAILS.
6. CONCEPTUAL DIMENSIONS FOR MAIN AND STRAIN GANTRY FOUNDATIONS ARE APPROXIMATELY 40' LONG AND 4' WIDE.



A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY V. SIBAL
DRAWN BY S. BURDEYNIK
CHECKED BY M. PAZ
IN CHARGE R. SCHMEDES
DATE 07/12/2013

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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT
TRACTION POWER DIRECTIVE

CONCEPTUAL LOCATIONS OF
TRACTION POWER FACILITIES

CONTRACT NO.
DRAWING NO. DD-TP-D401
SCALE NO SCALE
SHEET NO.



TYPICAL CATENARY FEEDING GANTRY ARRANGEMENT

1. TRACK AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THIS DRAWING SHOWS CROSS SECTION OF TYPICAL CATENARY FEEDING ARRANGEMENT WITH TRACTION POWER FACILITY LOCATED CLOSE TO THE RAILROAD FENCE, AND CORRESPONDS TO ALTERNATIVE NO. 1 DEPICTED IN "CONCEPTUAL LOCATIONS OF TRACTION POWER FACILITIES" DRAWING.
3. THE VERTICAL CLEARANCE BETWEEN THE CROSS SPAN FEEDER AND THE TOP OF THE OCS POLE SHALL BE 5'-0" TYP.
4. REFER TO DRAINAGE DIRECTIVE DRAWINGS FOR SPACE REQUIREMENTS OF CLOSED DRAINAGE SYSTEM.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	M. PAZ
DRAWN BY	S. BURDEYNIK
CHECKED BY	V. SIBAL
IN CHARGE	R. SCHMEDES
DATE	07/12/2013



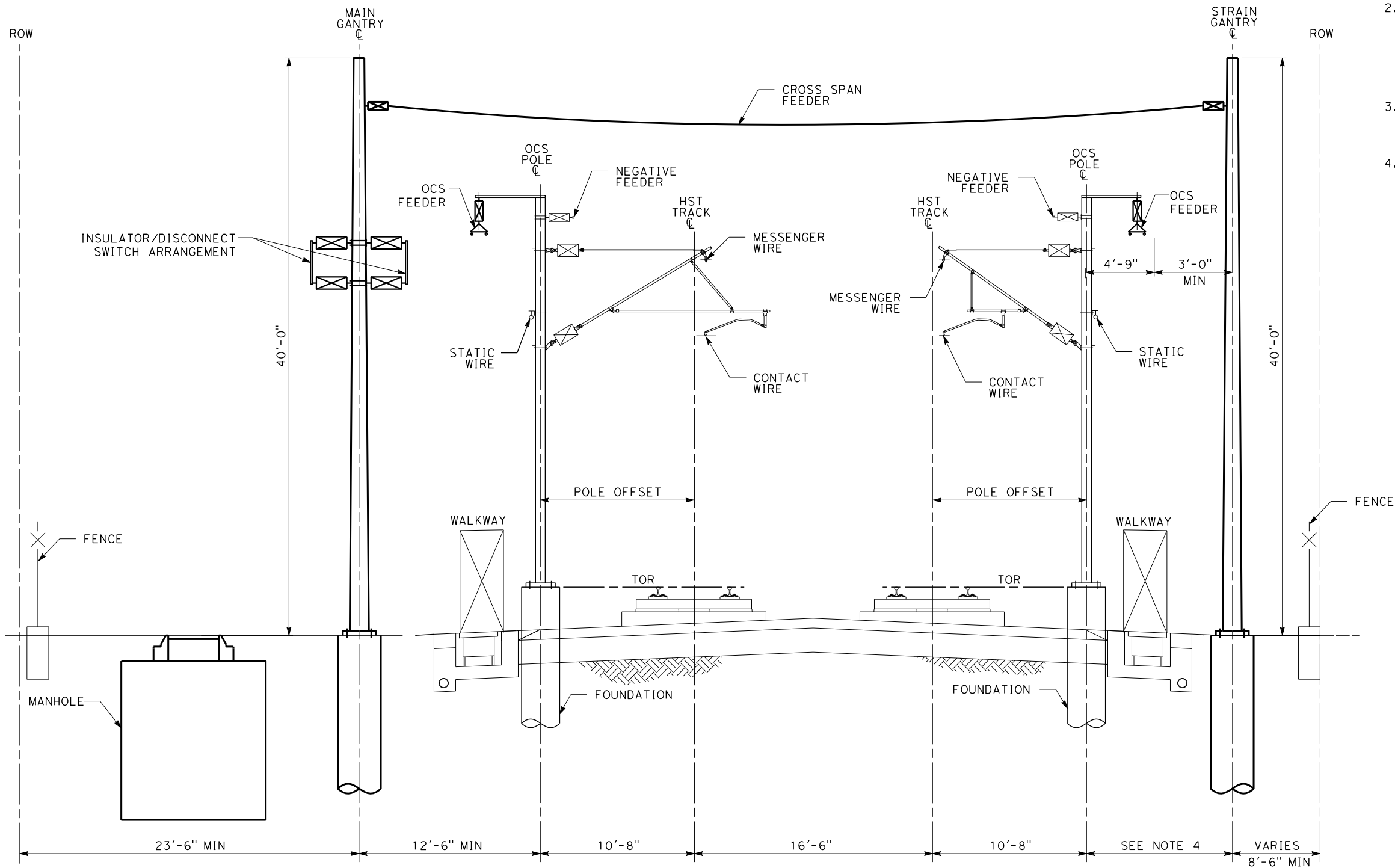
CALIFORNIA
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CALIFORNIA HIGH-SPEED TRAIN PROJECT TRACTION POWER DIRECTIVE

TYPICAL SINGLE CATENARY
FEEDING GANTRY ARRANGEMENT

CONTRACT NO.
DRAWING NO. DD-TP-F101
SCALE NO SCALE
SHEET NO.

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- NOTES:**
1. TRACK AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. THIS DRAWING SHOWS CROSS SECTION OF TYPICAL CATENARY FEEDING ARRANGEMENT WITH TRACTION POWER FACILITY LOCATED AWAY FROM THE RAILROAD FENCE, AND CORRESPONDS TO ALTERNATIVE NO. 2 DEPICTED IN "CONCEPTUAL LOCATIONS OF TRACTION POWER FACILITIES" DIRECTIVE DRAWING.
 3. THE VERTICAL CLEARANCE BETWEEN THE CROSS SPAN FEEDER AND THE TOP OF THE OCS POLE SHALL BE 5'-0" TYP.
 4. REFER TO DRAINAGE DIRECTIVE DRAWINGS FOR SPACE REQUIREMENTS FOR CLOSED DRAINAGE SYSTEM.

TYPICAL CATENARY FEEDING GANTRY ARRANGEMENT
TPF LOCATED AWAY FROM RAILROAD ROW

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY M. PAZ
DRAWN BY S. BURDEYNIK
CHECKED BY V. SIBAL
IN CHARGE R. SCHMEDES
DATE 07/12/2013

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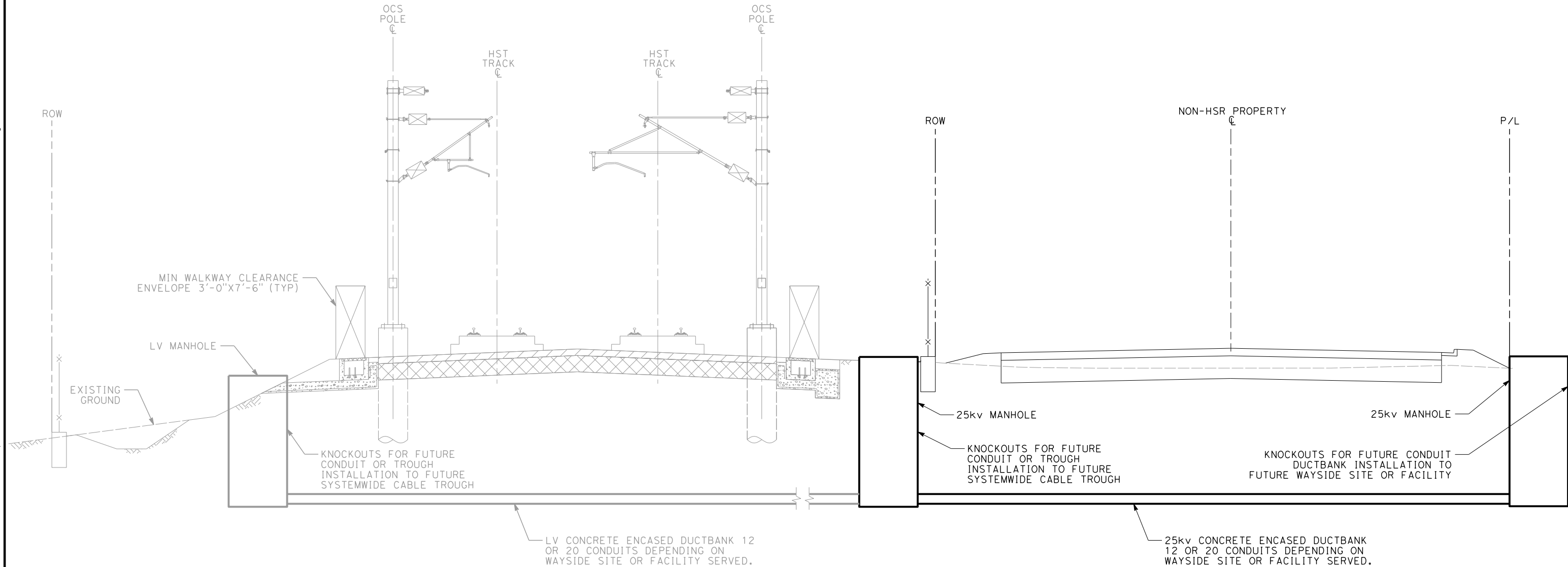
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
TRACTION POWER DIRECTIVE**

TYPICAL DOUBLE CATENARY
FEEDING GANTRY ARRANGEMENT

CONTRACT NO.
DRAWING NO. DD-TP-F102
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.
3. CABLE BENDING RADII SHALL CONFORM TO NEC OR MANUFACTURE REQUIREMENT WHICH EVER IS MORE STRINGENT.
4. DEPTH BELOW ROAD SHALL CONFORM TO APPLICABLE CODES.
5. CONCEPTUAL DRAWING ONLY. REFER TO DRAWING DD-TP-102 FOR ADDITIONAL DETAIL.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY M. PAZ
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IN CHARGE R. SCHMEDES
DATE 07/12/2013

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CALIFORNIA
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TRACTION POWER DIRECTIVE**

TYPICAL CROSS SECTION
SYSTEMS 25 KV
UNDERGROUND CONDUIT DUCTBANK
AT-GRADE

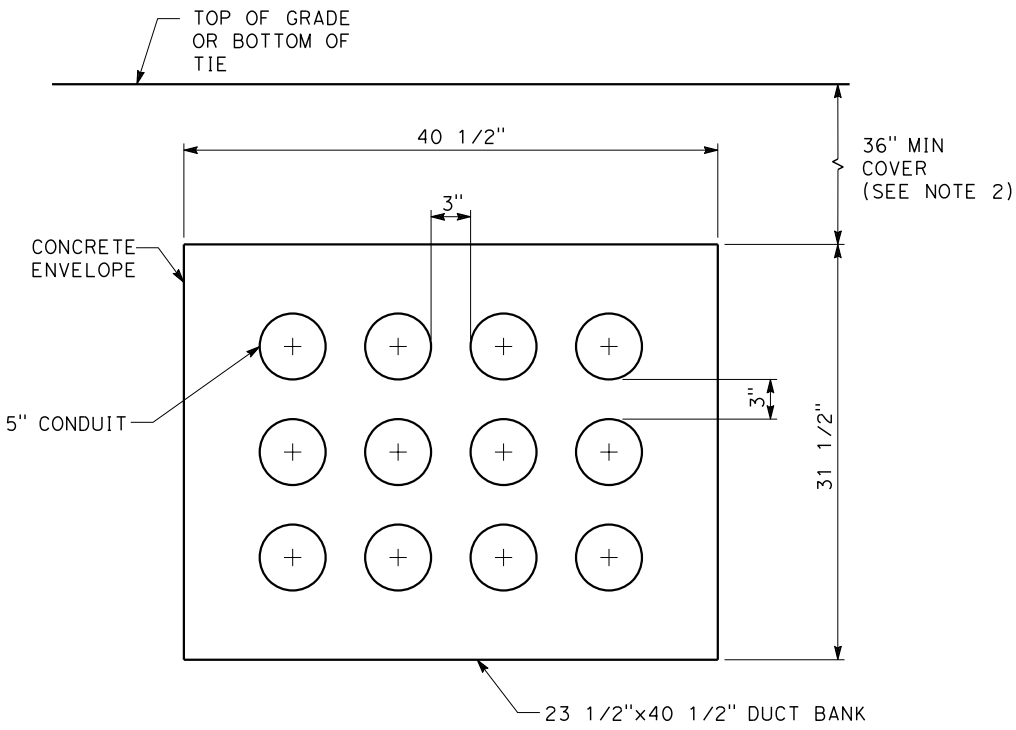
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SCALE NO SCALE
SHEET NO.

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Huante



3x4-WAY DUCT BANK 1
NO SCALE -

- NOTES:**
1. THIS DRAWING SHOWS TYPICAL DUCT BANK DETAILS FOR 5" CONDUIT FOR ILLUSTRATION PURPOSES ONLY. DESIGN THE DUCT BANK TO SITE AND EQUIPMENT SPECIFIC REQUIREMENTS CONFORMING TO RELEVANT CODES, SPECIFICATIONS AND DESIGN CRITERIA.
 2. A 36" MINIMUM COVER SHALL BE MAINTAINED FROM TOP OF GRADE TO TOP OF DUCT BANK, WHEN NOT GOING UNDER RAILROAD TRACK, AND A MINIMUM 5'-6" UNDER RAILROAD TRACKS FROM THE BOTTOM OF TIE.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY V. SIBAL
DRAWN BY V. HUANTE
CHECKED BY M. PAZ
IN CHARGE R. SCHMEDES
DATE 07/12/2013

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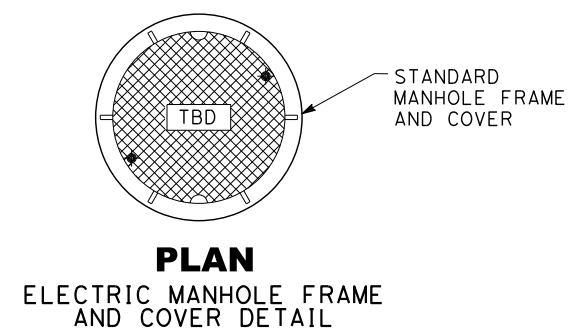
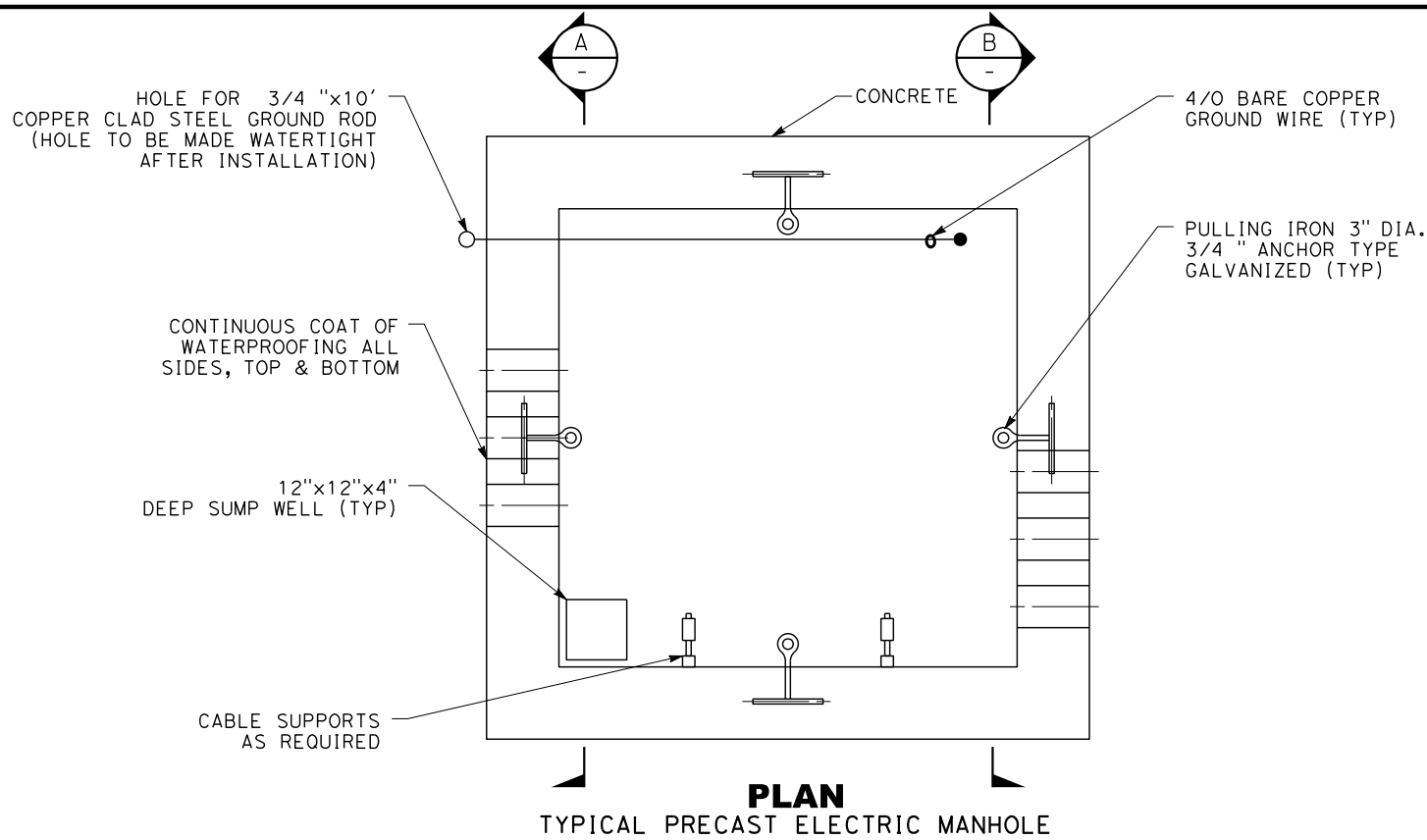
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TRACTION POWER DIRECTIVE**

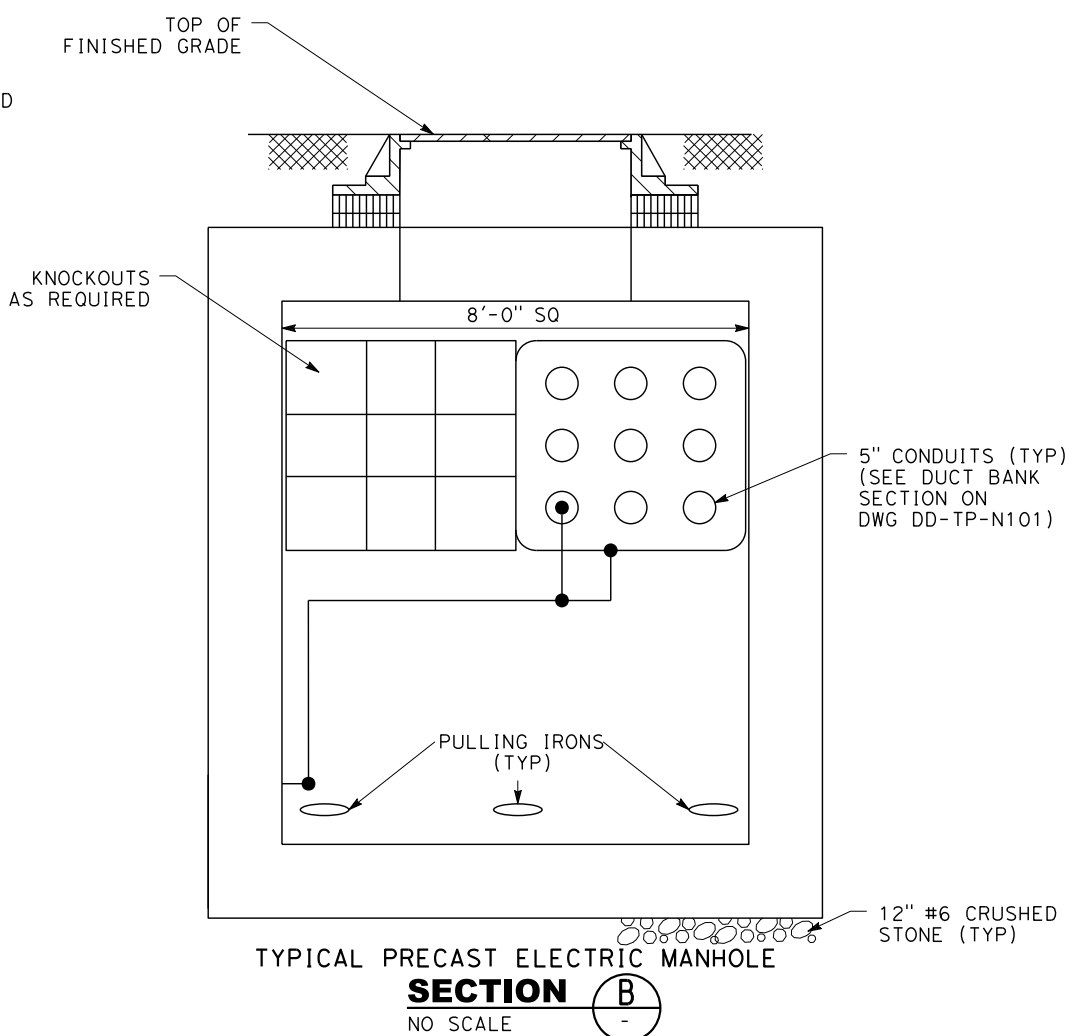
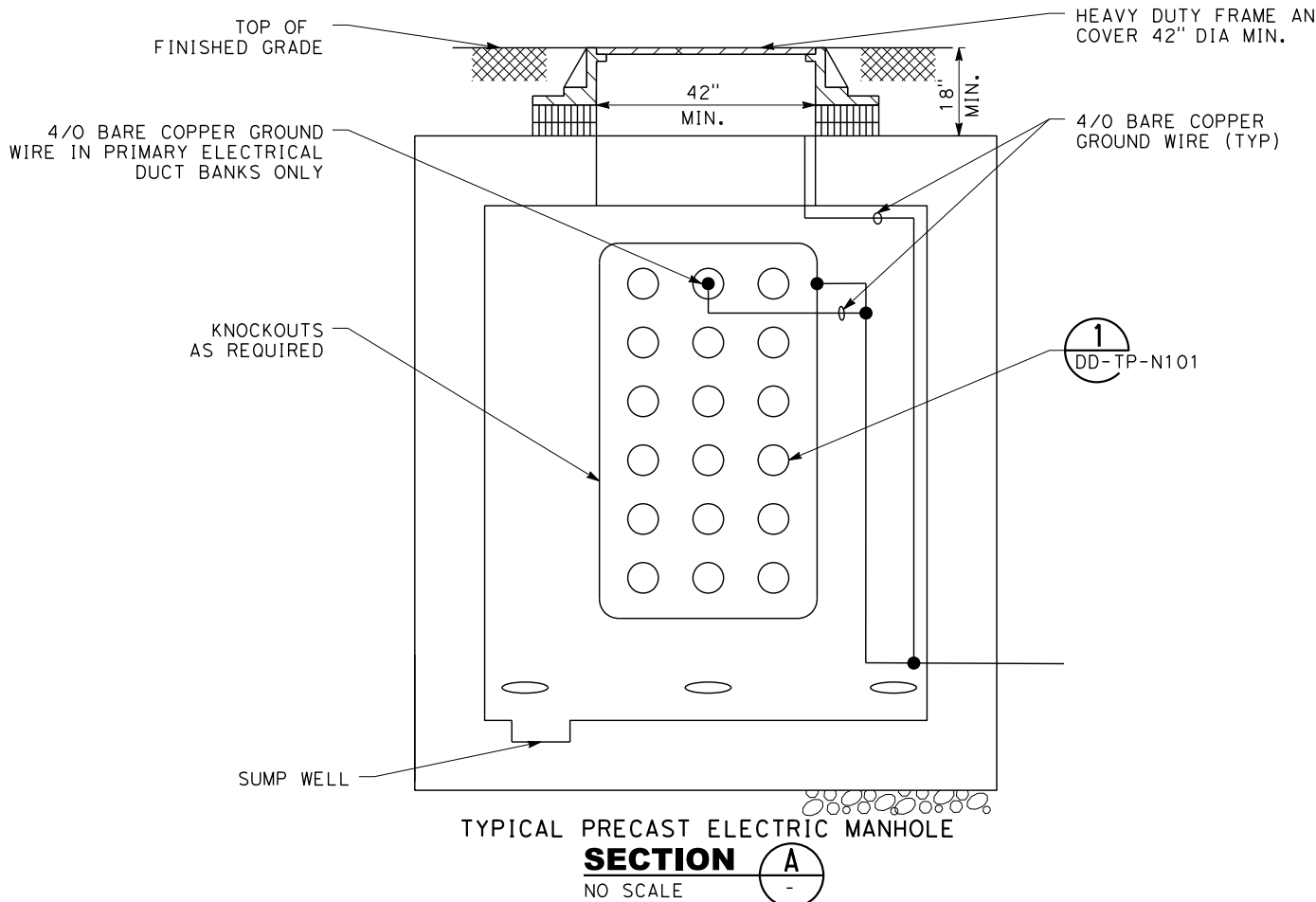
TYPICAL 25KV DUCT BANK DETAIL

CONTRACT NO.
DRAWING NO. DD-TP-N101
SCALE NO SCALE
SHEET NO.

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- NOTES:**
1. THIS DRAWING SHOWS TYPICAL DUCT BANK KNOCKOUTS IN A PRECAST MANHOLE. EXACT DETAILS TO BE WORKED OUT AT DETAILED DESIGN LEVEL.
 2. ALL TRACTION POWER MANHOLES SHALL BE TYPICALLY 8'-0" L X 8'-0" W X 9'-0" DEEP (INSIDE DIMENSIONS) AND BE WATERTIGHT WITH SILICON SEALING COMPOUND, OR APPROVED EQUAL.
 3. THE MANHOLE FRAME SHALL BE GROUTED TO THE ROOF SLAB.
 4. THICKNESS OF MANHOLE WALL SHALL BE 8" MINIMUM.
 5. APPROVED CABLE RACK ARMS TO BE INSTALLED TO ACCOMMODATE CABLE, MINIMUM 2 RACKS PER WALL (TYP).
 6. PULLING HOOKS TO BE GALVANIZED STEEL, SUPPLIED AND CAST INTO WALLS BY PRECASTER. ANCHORED BEHIND REINFORCEMENT, QUANTITY AND LOCATION TO SUIT.
 7. CONNECT ALL METALLIC PARTS, FRAME, PULLING HOOKS, ETC., TO THE TRACTION POWER FACILITY GROUND GRID OR GROUND ROD.
 8. PROVIDE FOR CONNECTION TO A PORTABLE PUMP TO REMOVE ACCUMULATED WATER FROM THE MANHOLE OR OTHER SITE SPECIFIC DRAINAGE SYSTEM.



REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY V. SIBAL
DRAWN BY V. HUANTE
CHECKED BY M. PAZ
IN CHARGE R. SCHMEDES
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



**CALIFORNIA HIGH-SPEED TRAIN PROJECT
TRACTION POWER DIRECTIVE**

TYPICAL 25KV MANHOLE DETAILS

CONTRACT NO.
DRAWING NO. DD-TP-N111
SCALE NO SCALE
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

California High-Speed Train Project



Request for Proposal for Design-Build Services

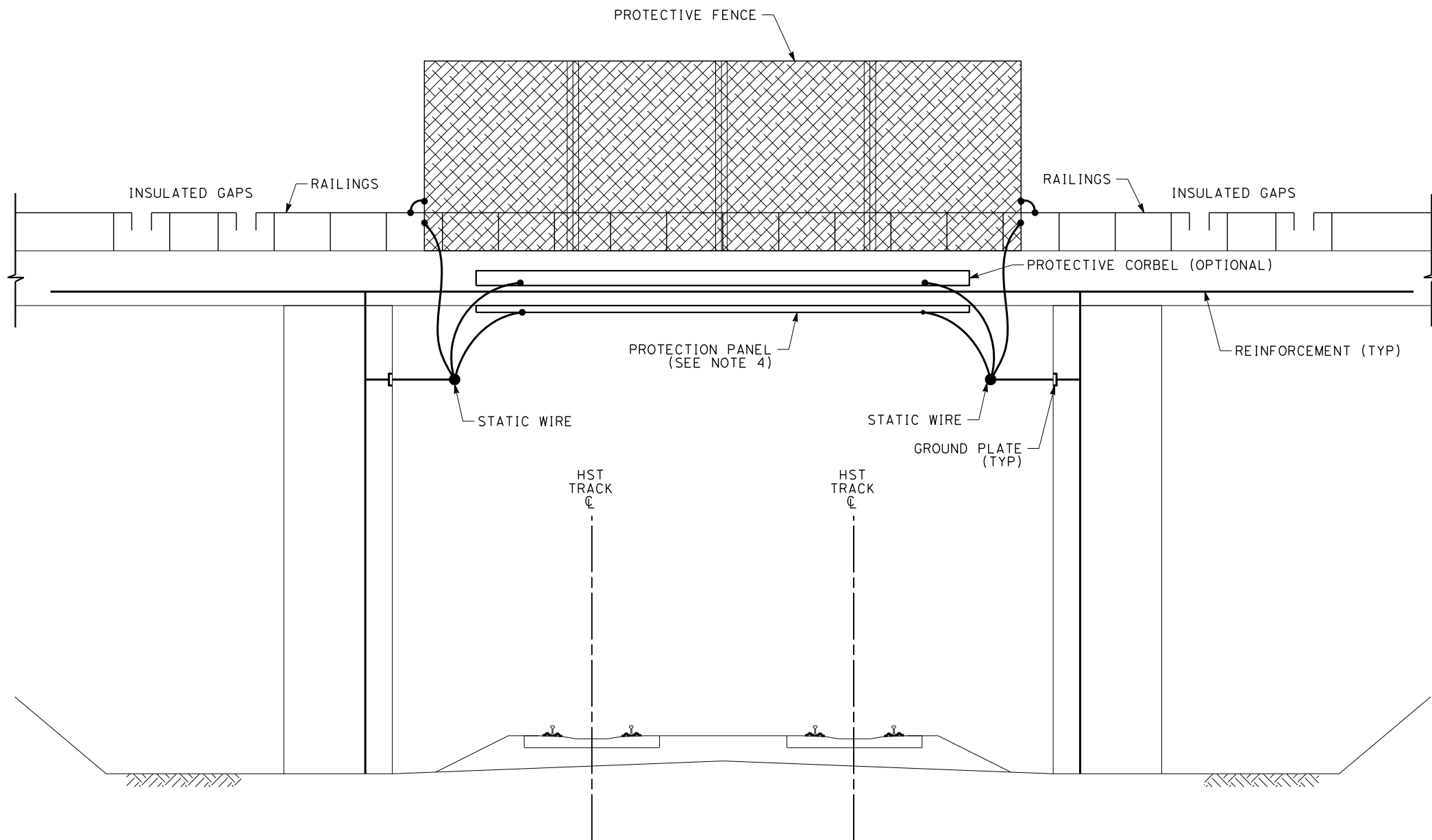
RFP No.: HSR 11-16
Directive Drawings

Overhead Contact System

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. SMALL METALLIC ITEMS, SUCH AS RAILING, FENCE ETC, BEYOND THE STEP AND TOUCH POTENTIAL LIMIT NEED NOT BE GROUNDED. THE STEP AND TOUCH POTENTIAL EXISTS WITHIN 8' OF A STANDING TRAIN, 8' FROM ANY ELECTRICALLY CONTINUOUS BONDED FENCE, OR 8' FROM ANY METALLIC ITEM BONDED TO STATIC WIRE.
3. GROUNDING DETAILS DESIGN SHALL BE COORDINATED WITH OVERPASS STRUCTURE DESIGNER.
4. OVERHEAD BRIDGE GROUNDING AND BONDING DETAILS SHOWN IN DRAWING ARE GENERIC IN NATURE. THE FINAL DESIGNER SHALL PROVIDE DETAIL ASSEMBLIES AND COMPONENTS THAT MEET THE REQUIREMENT.
5. GALVANIZED STEEL STRIP OR ANGLE SECTION SHALL BE INSTALLED ABOVE THE OVERHEAD LINE AT EACH BRIDGE FACE, IF THE BRIDGE SOFFIT IS WITHIN THE PANTOGRAPH ZONE. WHEN THE VERTICAL CLEARANCE BETWEEN OCS CONDUCTORS AND CONCRETE OVERPASSES IS LESS THAN 3 FEET, PROTECTION PANELS (FLASH PLATES) SHALL BE INSTALLED ABOVE THE OCS, ATTACHED TO THE UNDERSIDE OF THE STRUCTURE, AND INTERCONNECTED TO THE STATIC WIRE AT NOT LESS THAN TWO LOCATIONS.
6. THE GROUND PLATE SHALL BE NO LESS THAN 6" X 6" IN DIMENSION.

TYPICAL OVERHEAD STRUCTURE GROUNDING AND BONDING

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. LAU
DRAWN BY T. DOUNG
CHECKED BY M. HSIAO
IN CHARGE R. SCHMEDES
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

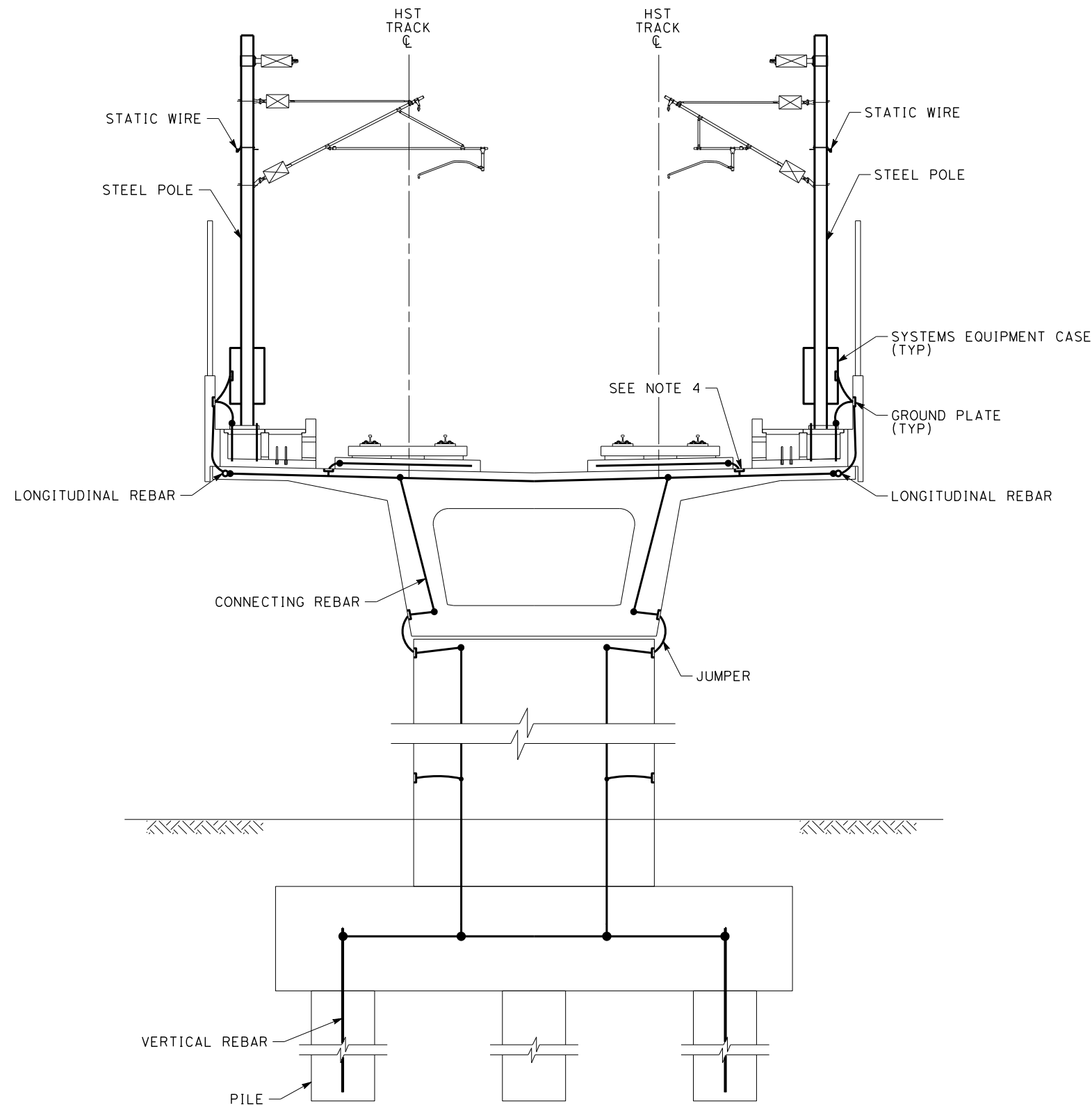
CALIFORNIA HIGH-SPEED TRAIN PROJECT OVERHEAD CONTACT SYSTEM DIRECTIVE

TYPICAL GROUNDING AND BONDING ARRANGEMENT
GRADE SEPARATED STRUCTURE
220 MPH SEGMENT

CONTRACT NO.
DRAWING NO. DD-OC-2046
SCALE NO SCALE
SHEET NO.

05/14/2013 HSR 13-06 - EXECUTION VERSION

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**TYPICAL OCS GROUNDING AND BONDING
AT AERIAL STRUCTURE**

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. GROUNDING AND BONDING DETAIL DESIGN SHALL BE COORDINATED WITH AERIAL STRUCTURE DESIGNER.
3. THE GROUNDING AND BONDING FOR THE EMERGENCY WALKWAY AREA AND OTHER PUBLICLY ACCESSIBLE AREAS SHALL BE DESIGNED TO AVOID INADMISSIBLE TOUCH AND STEP VOLTAGES AND ALSO MEET THE SIGNALING OPERATION REQUIREMENTS.
4. FOR LOCATIONS OF THE GROUND PLATES, SEE GROUNDING AND BONDING DESIGN CRITERIA FOR DETAIL.
5. THE GROUND PLATES ON THE AERIAL STRUCTURE SLAB SHALL BE PLACED BETWEEN THE EDGE OF THE TRACK SLAB AND DERAILMENT WALL.
6. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION.

A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY J. LAU
DRAWN BY T. DOUNG
CHECKED BY M. HSIAO
IN CHARGE R. SCHMEDES
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
OVERHEAD CONTACT SYSTEM DIRECTIVE**

TYPICAL GROUNDING AND BONDING ARRANGEMENT
AERIAL STRUCTURE
220 MPH SEGMENT

CONTRACT NO.
DRAWING NO. DD-OC-2047
SCALE NO SCALE
SHEET NO.



TYPICAL GROUNDING AND BONDING ARRANGEMENT IN CUT AND COVER TUNNEL

1. GROUNDING AND BONDING DETAILS DESIGN SHALL BE COORDINATED WITH CIVIL DESIGNER.
2. EACH STATIC WIRE SHALL BE BONDED TO THE TUNNEL REBAR WITH THE ADEQUATE INTERVAL TO MEET THE STEP AND TOUCH POTENTIAL SAFETY REQUIREMENTS, BUT NOT LESS THAN TWO CONNECTIONS PER STRUCTURE.
3. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION.
4. FOR REQUIRED LOCATIONS OF THE GROUND PLATES, SEE GROUNDING AND BONDING DESIGN CRITERIA FOR DETAIL.

REV	DATE	BY	CHK	APP
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1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. THE CROSSOVER OVERLAP CATENARIES HAVE TO BE SEPARATED BY A TYPICAL AIR GAP OF 18", EVEN WHEN OUT OF RUNNING CONTACT WIRE CROSSES THE OTHER CATENARY TO THE ANCHOR.
3. THE DESIGN OF CROSSOVER OVERLAP SHALL ENSURE COMPLIANT TRAINS MOVING SMOOTHLY FROM MAINLINE TRACK CATENARY THROUGH THE CROSSOVER TRACK CATENARY AND BACK TO MAINLINE TRACK CATENARY TO CLEAR OF THE PANTOGRAPH ENVELOPE.
4. THE GROUND PLATE SHALL BE NO LESS THAN 6"x6" IN DIMENSION

A	05/31/13
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IN CHARGE
R. SCHMEDES

CALIFORNIA HIGH-SPEED TRAIN PROJECT OVERHEAD CONTACT SYSTEM DIRECTIVE

GROUNDING AND BONDING ARRANGEMENT
OPEN TRENCH
220 MPH SEGMENT

NO SCALE
SHEET NO.

California High-Speed Train Project

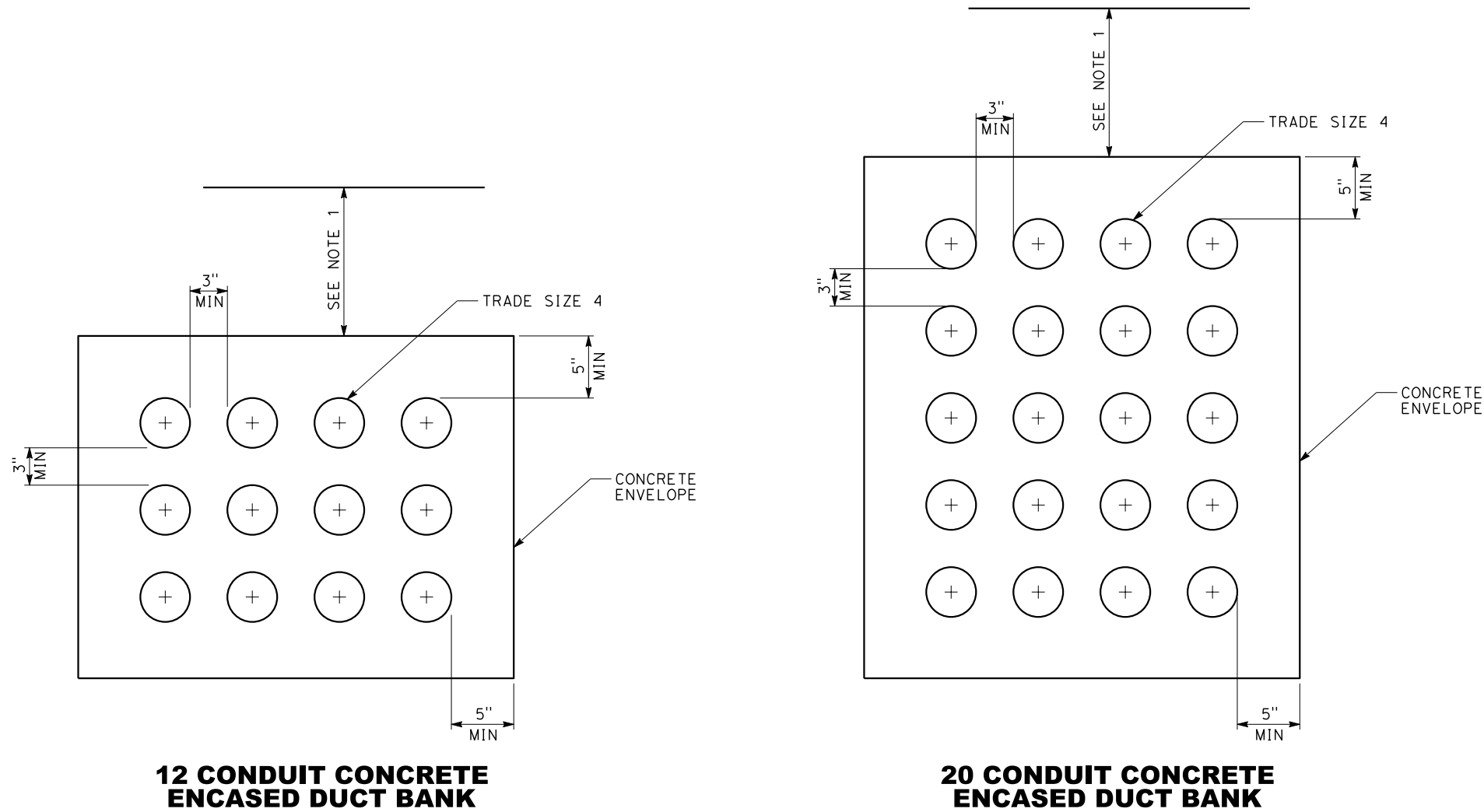


Request for Proposal for Design-Build Services

RFP No.: HSR 11-16
Directive Drawings

Communications

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- NOTES:**
1. CONCRETE ENCASED DUCT BANK TO BE PLACED A MINIMUM 6' BELOW TOP OF RAIL AND MINIMUM 3' BELOW GRADE WHEN NO RAIL IS PRESENT.
 2. LOW VOLTAGE DUCT BANK TO BE LOCATED PER THE CRITERIA LISTED IN THE COMMUNICATIONS DESIGN CRITERIA CHAPTER.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY B. BANKS
DRAWN BY V. HUANTE
CHECKED BY C. DALOIA
IN CHARGE R. SCHMEDES
DATE 07/12/2013

**PARSONS
BRINCKERHOFF**



CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE**

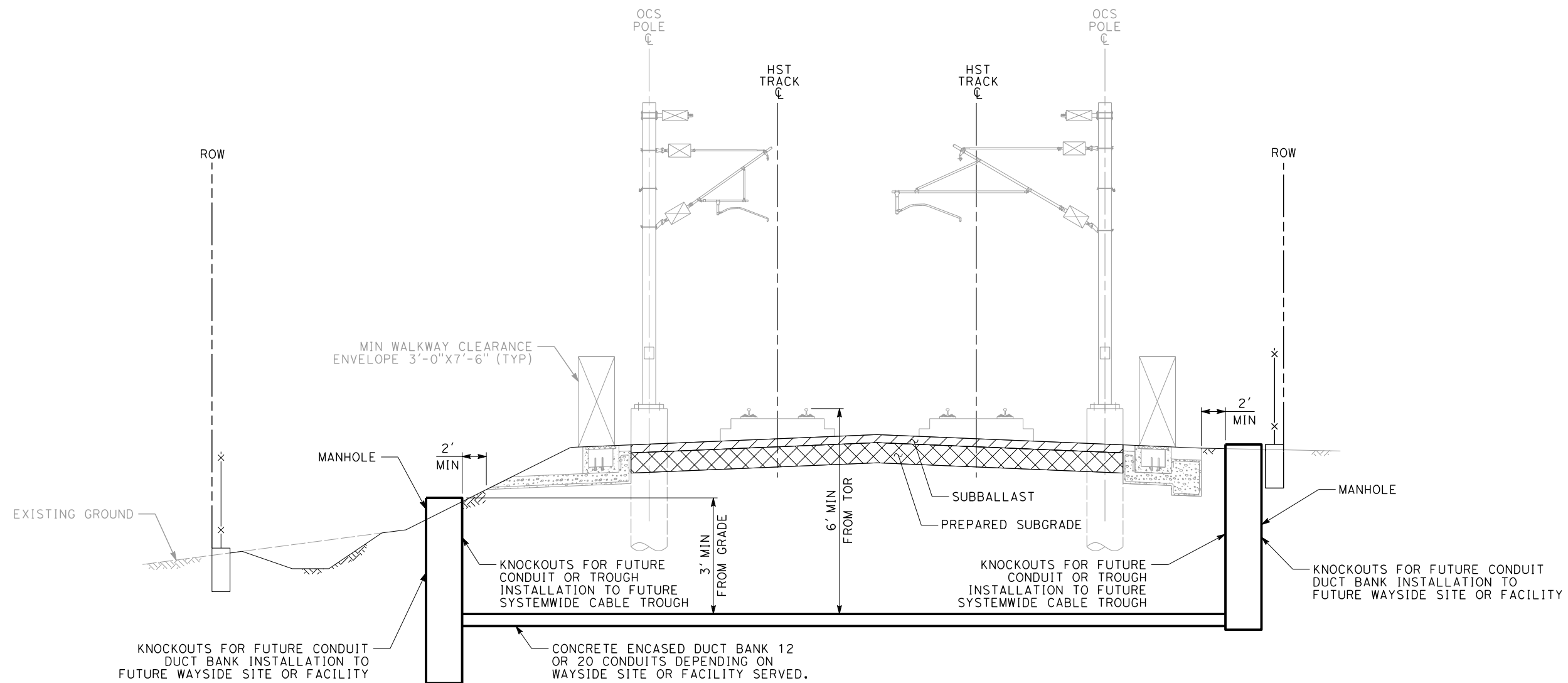
TYPICAL CROSS SECTION
SYSTEM LOW VOLTAGE
CONDUIT DUCT BANK

CONTRACT NO.
DRAWING NO. DD-CO-G021
SCALE NO SCALE
SHEET NO.

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NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY B. BANKS
DRAWN BY V. HUANTE
CHECKED BY C. DALOIA
IN CHARGE R. SCHMEDES
DATE 07/12/2013

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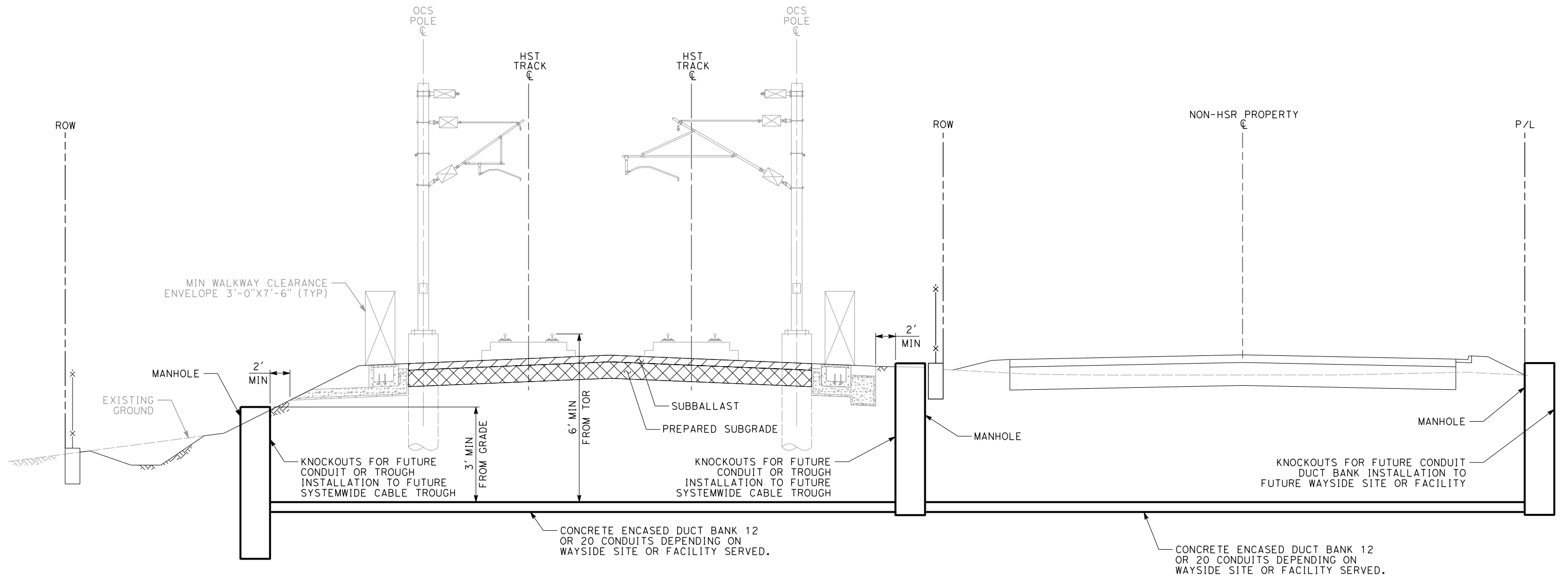
CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE**
TYPICAL CROSS SECTION
SYSTEMS LOW-VOLTAGE
UNDERTRACK CONDUCT CONDUIT DUCT BANK
AT-GRADE

CONTRACT NO.
DRAWING NO. DD-CO-G022
SCALE NO SCALE
SHEET NO.

NOTES:

1. TRACK, SYSTEMS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
2. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.



A	05/31/13				EXECUTION VERSION
REV	DATE	BY	CHK	APP	DESCRIPTION

DESIGNED BY	B. BANKS
DRAWN BY	V. HUANTE
CHECKED BY	C. DALOIA
IN CHARGE	R. SCHMEDES
DATE	07/12/2013

**PARSONS
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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

CALIFORNIA HIGH-SPEED TRAIN PROJECT COMMUNICATIONS DIRECTIVE

TYPICAL CROSS SECTION
SYSTEMS LOW-VOLTAGE
UNDER TRACK/UNDERGROUND CONDUIT DUCT BANK
AT-GRADE

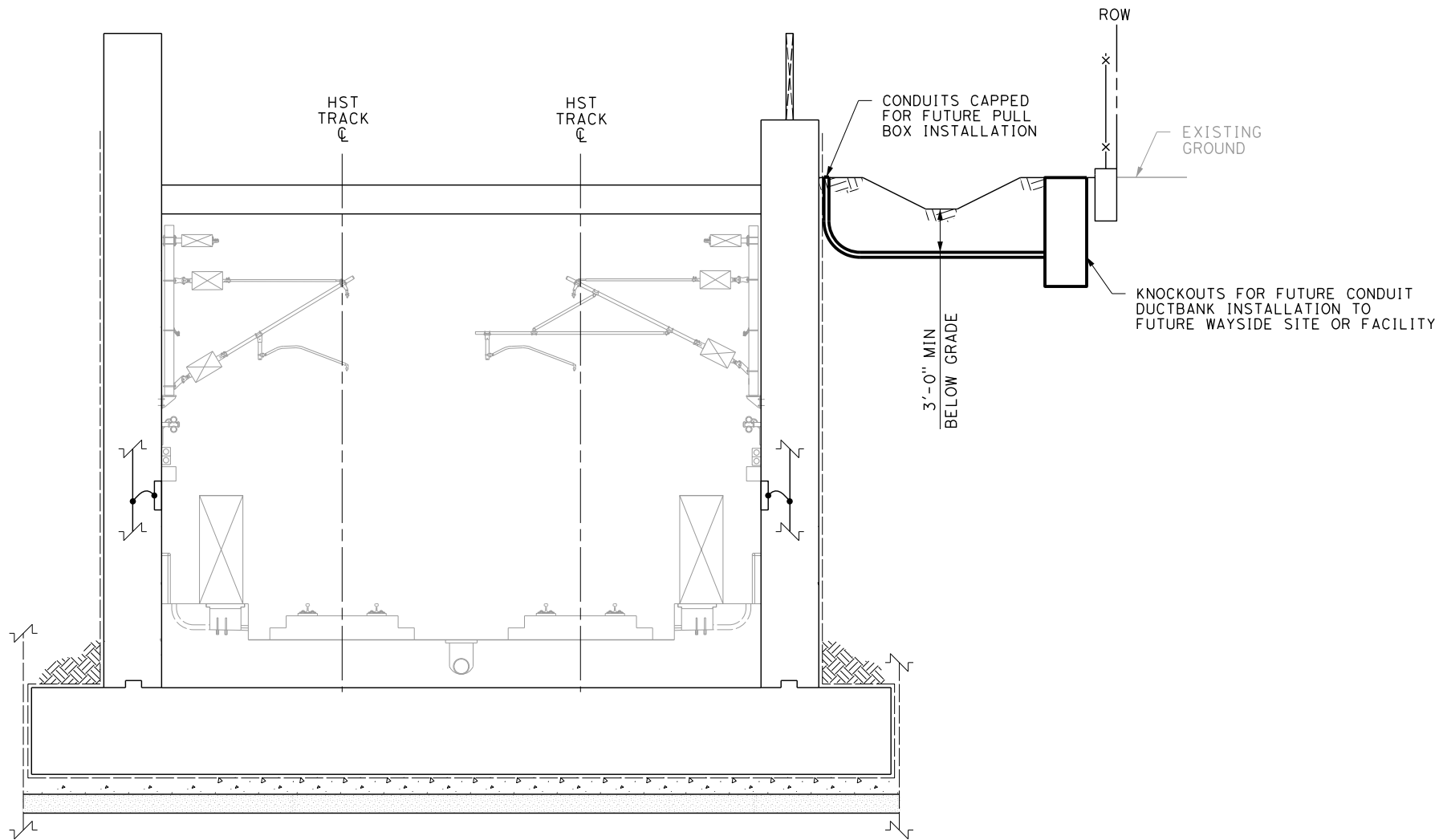
CONTRACT NO.

DRAWING NO.
DD-CO-G023

NO SCALE

SHEET NO.

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TYPICAL TRENCH SECTION

- NOTES:**
1. TRACK, STURCTURES, OCS AND DRAINAGE ARE SCHEMATIC AND DO NOT REPRESENT DESIGN.
 2. MANHOLE AND CONDUIT TO BE PLACED ON SIDE OF WAYSIDE LOCATION.
 3. TOP OF MANHOLE STRUCTURE SHALL NOMINALLY BE 2" ABOVE GRADE.

REV	DATE	BY	CHK	APP	DESCRIPTION
A	05/31/13				EXECUTION VERSION

DESIGNED BY B. BANKS
DRAWN BY V. HUANTE
CHECKED BY C. DALOIA
IN CHARGE R. SCHMEDES
DATE 07/12/2013

**PARSONS
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CALIFORNIA
HIGH-SPEED RAIL AUTHORITY

**CALIFORNIA HIGH-SPEED TRAIN PROJECT
COMMUNICATIONS DIRECTIVE**
TYPICAL CROSS SECTION
SYSTEMS LOW-VOLTAGE
UNDERGROUND DUCTBANK INSTALLATIONS
TWO TRACK TRENCH

CONTRACT NO.
DRAWING NO. DD-CO-G024
SCALE NO SCALE
SHEET NO.